

Does active fund management add value?

- An Empirical Investigation of the Performance of Swedish Mutual Equity Funds, 2000-2011.

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Abstract

This study investigates the performance of 37 Swedish mutual equity funds during the period of January 2000 to July 2011. The study focuses on fund managers' stock selection and market timing skills, as well as their ability to repeat historical performance over subsequent periods. In order to relax the assumption of a constant beta estimate, the regressions are performed in a conditional setting, in addition to the standard unconditional setting. The overall results suggest that fund managers have performed neutrally to weakly negative as indicated by the net expense alphas. Yet, when using gross returns, the results of managerial stock selection ability are positive. The fund expenses' negative impact on performance is best shown in the tests where the low-expense funds outperform the high-expense funds. Moreover, the results of fund managers' ability to time the market are neutral to weakly positive. Yet, when adding terms to the standard regression in order to encompass managerial market timing aspirations, the alpha estimates are simultaneously severely punished below zero. Finally, no evidence of performance persistence is documented. In all, it seems very difficult to justify the high level of expenses when seeing the risk-adjusted net returns that the actively managed funds have produced.

Foreword

A special thanks is directed to my supervisor Gabriele Lepori who has provided me with invaluable feedback when carrying out this study. I also want to thank Karl Marthon at Morningstar for providing me with the fund data and for responding to data related queries.

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1 Introduction

Section 1 gives an introduction to the topic of portfolio performance measurement and to the purpose of this study. This section also includes the study's contribution to the existing literature as well as its delimitations.

1.1 Background

One of the classic discussions within finance theory since the 1960s is the one about markets being informationally efficient. In case the theory holds, securities prices reflect all available information. The time and resources put down by analysts to identify undervalued securities would then be in vain, since the given market prices are correct. An efficient market would also imply that a strategy based on active portfolio management is dominated by a passive investment strategy, which does not aspire to outperform the market. Starting with Jensen (1967, 1969), the findings from most of the older academic studies pointed in the same direction: net of expenses, the performance of actively managed mutual funds is lower than the ditto of a comparable market proxy. (Otten and Bams, 2002) However, more recent studies have demonstrated the opposite, suggesting that managers of active mutual funds to some extent are able to generate abnormal returns. (Ippolito, 1989) (Lee and Rahman, 1990) In addition to the deviating results from different studies, the procedure of estimating risk-adjusted performance is intensively debated in the literature. Despite its drawbacks, many studies rely on some version of the Jensen (1967) model to estimate portfolio performance.

While many studies of portfolio performance have been carried out on the US mutual fund industry up until today, the European market has attracted less interest among academics. (Otten and Bams, 2002) In Sweden, the scrutiny of the fund industry could almost be described as non-existent. The purpose of this study is therefore to fill this gap by employing traditional performance measures on a set of actively managed mutual equity funds in Sweden. More precisely, the study examines whether the managers of these funds are able to create value for their fund savers despite the higher expenses compared to a passive investment strategy. It should be noted that this study does not aim at providing any guidance in which individual funds an investor should bet on for future investments. Instead, the aim is to investigate whether

investors in general should accept higher fund expenses for an actively managed fund, or if a passive investment strategy, with lower fund expenses, is preferred.

1.2 Topic of issue

As it was indicated above, this study investigates if the performance of actively managed mutual equity funds can justify the magnitude of fund expenses borne by the fund saver. Thus, the topic of issue is:

- Does active management add value to the fund savers?

1.3 Contribution

This study of Swedish mutual equity funds carries several advantages with it. Firstly, the study is comprehensive as it comprises tests of managers' stock picking and market timing skills, as well as their ability to repeat the portfolio performance over subsequent periods. Secondly, the method of study takes different angles as it includes tests using both unconditional and conditional models in addition to tests based on funds' returns both net and gross of expenses. Thirdly, the sample of 37 Large Cap funds constitutes a highly homogenous group with similar characteristics and investment strategies. Finally, the study targets a market that despite its tremendous growth over the last decades is fairly undiscovered among academics. These advantages combined are exploited in order to contribute to the existing literature on performance measurement.

1.4 Delimitations

In Sweden today, there are more than 4000 funds considering all types of funds that invest in all types of securities. This study, however, focuses exclusively on 37 Swedish mutual equity funds that invest in Swedish Large Cap companies. This means that the study only aims at estimating the performance of a small sub-set of the overall Swedish mutual fund industry.

An underlying assumption throughout the study has been that the return of a fund adequately can be predicted by a model in which the market return, in different forms, is the only factor. Although this model has been used both in an unconditional and a conditional setting, this study ignores the fact that some academics suggest a model improvement when including some additional explanatory factors like in Fama and French (1993) or Carhart (1997).

Finally, the data used for the study mainly includes surviving funds; i.e. funds that were in existence at the end of the observation period. Thus, those funds that were active at some point in time after the start of the observation period, yet that ceased their operations before the end, are not included in the sample. Several academics argue that the exclusion of non-surviving funds may bias the overall fund performance upwards. This may be the case also in this study.

1.5 Outline

The remainder of this paper is organized as follows. Section 2 includes an introduction to the Swedish fund market with adjacent regulations. Section 3 contains a review of the existing literature within performance measurement and also the empirical results from previous studies are presented. Furthermore, the topics of market efficiency, unconditional and conditional models and the survivorship bias are discussed in section 3. Section 4 presents the methodology used for the empirical study as well as its data-related issues. Section 5 contains both the stated hypotheses and the empirical findings of the study and section 6 contains the analysis of these findings. In section 7, the concluding remarks are presented. Finally, section 8 discusses some suggestions for future research.

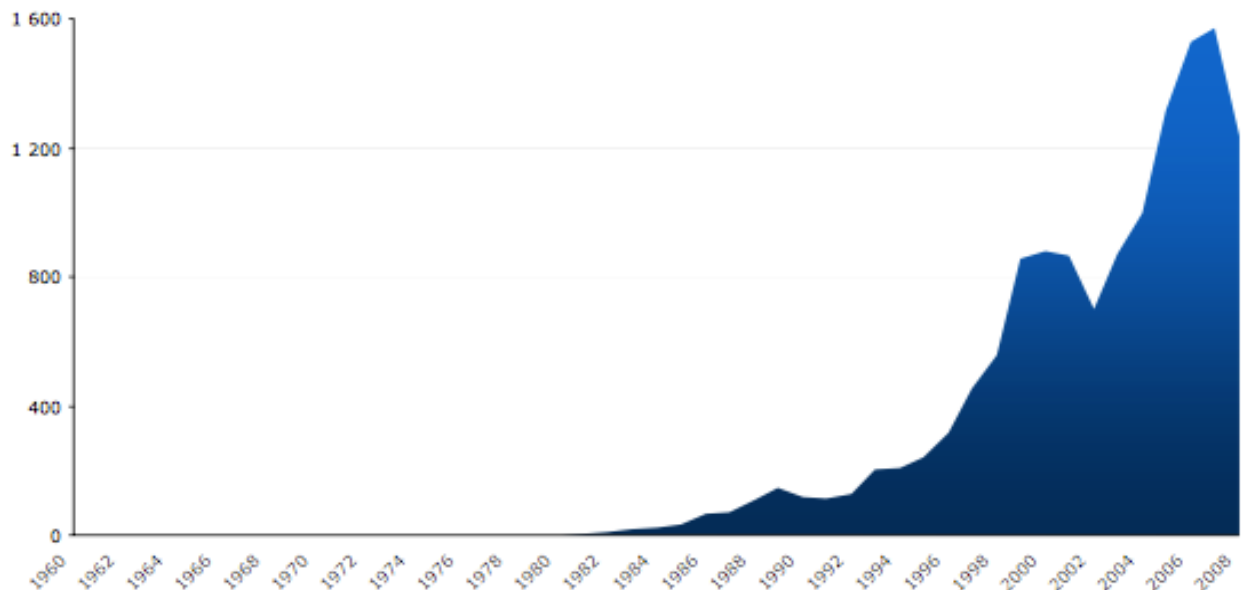
2 Swedish fund market

Section 2 gives an introduction to the Swedish fund market. The history of the Swedish population's fund savings as well as the most important regulations of the Swedish fund market are presented.

2.1 Introduction to the Swedish fund market

Over the last 30 years, Swedish investments in mutual funds have seen a dramatic increase. Between 1980 and 2009, the investments grew from 1 billion SEK to more than 1200 billion SEK (see Figure 1). (Pettersson et al, 2009) This corresponds to an average yearly increase of around 27%!

Figure 1 - Development of the Swedish aggregated fund value (billions SEK).



Source: Pettersson et al (2009)

Over the same period, the number of funds in the Swedish investment fund market increased from 17 to over 4000. In 2009, 98% of the Swedish population (18-74 years of age) owned shares in a fund if including the premium pension savings¹. There are several important reasons to the Swedes' appetite for fund savings; one has doubtlessly been the advantageous tax rules. In

¹ When excluding the premium pension, the figure drops to 74%.

1978, a governmental scheme called “Skattespar”² was introduced in response to the private sphere’s prevailing lack of risk capital. The “Skattespar” funds could exclusively invest in Swedish equities. For individual fund savings up to a monthly limit of SEK 400 per person (and later SEK 600 per person), this scheme included 20% tax deductions towards the income tax, and the return for the first five years of savings were free of tax. Despite these incentives, the real take-off for Swedish fund savings occurred in 1980 when the tax deductions towards the income tax were increased to 30%. Between 1979 and 1982, the number of fund savers increased from 75 500 to 425 000. A later programme called “Allemansspar”³ was put in place by the Social Democratic Party soon after it re-gained the power in the 1982-election. The new funds, named “Allemansfonder”, were similar to the funds in the “Skattespar”-programme even though the new invention implied more power to the fund savers. Although the tax deductions towards the income part was abolished in the new programme, the tax exemption for returns was extended from the prior five years limit to not have any time limit at all. This latter tax exemption was in place until 1990, and was then replaced by an overall level of 20% tax on fund returns in 1991 – still far below the tax on other capital gains of 30%. (Pettersson et al, 2009) Not until 1997 did the tax benefits of “Allemansspar” disappear. Yet, by then, the Swedish population’s fund investments had reached an amount of 456 billion SEK (Dahlquist et al, 2000). Another governmental programme to incentivize the fund saving was the so-called “Premiepension”⁴, introduced in 1994. In this programme, 2,5% of the Swedes’ monthly salaries is destined for the Premiepension, where Swedes themselves decide what funds to invest in. Compared to the total Swedish fund value, the investments destined for the Premiepension went from 7% in 2000 to 23% in 2008. (Pettersson et al., 2009)

With a beginning in the 1990s, several dramatic shifts took place in the Swedish investment fund market. In 1990, 86% of the Swedish fund’s equity investments were in Swedish companies. 10 years later though, this figure had dropped to a mere 19% (although funds with a Swedish and Global focus represented an additional 39%). During the same period, the investments in foreign funds and sector funds increased from 14% to 42%. Regarding the type of securities the funds invest in, only Swedish equity and fixed income funds were sold until 1990. However, in the

² Tax-save funds

³ Public savings programme

⁴ Premium pension

1990s, balanced funds comprising both equity and fixed income securities were introduced. These funds gained market shares rapidly and constituted 19% of total fund investments in 2000. During the same period, the fixed income funds went from 40% to 14% while equity funds increased from 60% to 67%, measured as the share of the total fund investments. Another important feature of the Swedish fund market has been the intensified competition during the last decade. Between 1999 and 2008, the four major banks in Sweden (Nordea, SEB, Swedbank and Handelsbanken) saw their market share of total fund value decrease from 85% to 67%. In the meantime, the number of funds increased from 1500 to over 4000. Possible explanations to these changing market conditions are the arrival of foreign actors targeting the Swedish fund savers, and the technological development with smaller players being able to reach the customers. (Pettersson et al, 2009)

2.2 Regulations of the Swedish fund market

In 2001, the European Union adopted a directive called UCITS III (Undertakings for Collective Investments in Transferable Securities), which was a further development of the earlier installed UCITS-regulations. The purpose with the harmonized legislation is to assure a decent consumer protection for fund savers and to enable a good supply of fund products across Europe.⁵ In Sweden, the new directive was implemented in 2004 through the Investment Funds Act⁶. From this point in time, funds were collectively referred to as Investment funds, and comprised both mutual funds and Special funds. The first category (hereafter called “UCITS-fund”) obeys to the same rules as what is stated in the UCITS-framework. Special funds on the other hand are subject to national legislation and have less strict guidelines for investments and risk diversification. An important feature of the Swedish UCITS-funds is that these funds, unlike the non-UCITS funds, have been approved by the Swedish Financial Supervisory Authority⁷ and can be freely marketed across the EES-countries. However, the UCITS-titling also implies some restrictions. First of all, these funds cannot invest more than 10% of the fund value in one single security⁸. Furthermore, there is a 40% aggregate cap of fund value for securities constituting more than 5% of the fund value. This means that the minimum number of securities a UCITS-fund can have is 16. To further incentivize risk diversification, a 20% cap of the fund value has

⁵ www.swedsec.se

⁶ Swedish: “2004:46 - Lagen om Investeringsfonder”

⁷ Swedish: ”Finansinspektionen”

⁸ The regulation is different for index funds and Fund-of-Funds

been set for securities issued by actors belonging to the same sector. Regarding the investment alternatives, the general rule is that a UCITS-fund must invest in securities that are (or within one year are expected to be) listed on an exchange or other authorized market place. A maximum of 10% of the fund value can be invested in non-listed securities though. The approved securities for a Swedish UCITS-fund are stocks, bonds, money market instruments, derivatives and shares in other funds. However, an equity fund must have more than 75% of the holdings in equity or equity related instruments. (Nilsson, 2004) Thus, although there is room for the portfolio manager to tilt the portfolio towards low risk securities such as money-market instruments in volatile periods, this portion cannot exceed $\frac{1}{4}$ of the total portfolio holdings.

Special funds are not the focus of this paper, but still relevant for the introduction to the Swedish fund market as well as for the selection of funds in the study (see section 4.1). These funds have the Financial Supervisory Authority's permission to somehow deviate from the rules concerning the Swedish UCITS-funds. For instance, some of these funds have single investments greater than 10% of total fund value. Despite the greater flexibility, the Special funds still need to fulfil some diversification requirements. Yet, there are no fix guidelines to the investment limits, but instead, the supervisor makes an individual evaluation of each Special fund's risk diversification. (Nilsson, 2004)

3 Theory

This section gives a review of the existing literature on performance measurement as well as the empirical findings in the American, European and Swedish market. The section also presents various popular methods for performance measurement. The last part introduces the topics of market efficiency, unconditional and conditional models and survivorship bias.

3.1 Literature review

Early development of performance measures

Since the 1960s, academics have carried out a great amount of studies assessing the performance of the mutual fund industry. (Christensen, 2005) (Bodie et al, 2009) Realizing the great contribution from the development of the Capital Asset Pricing Model (CAPM), William Sharpe (1966), Jack Treynor (1966) and Michael C. Jensen (1967) developed their own models for portfolio performance measurement. Jensen's (1967) alpha, which is an absolute measure of portfolio performance and directly derived from the CAPM, has had a significant impact on the performance measurement. Even today, Jensen's approach is the most commonly used method among academics. (Bodie et al, 2009) (Grinblatt and Titman, 1993) In his study, Jensen (1967) compared the actual returns of actively managed mutual funds with the CAPM-predicted returns by regressing the funds' returns in excess of the risk-free rate with the market excess returns. Despite a great receiving of Jensen's contribution in the academic society, the model has also been subject to criticism. The most severe drawbacks of the method have been focused on three different areas. First, in line with the CAPM, Jensen's method is based on the assumption of a directly observable market portfolio. Roll (1978), one of the most pronounced critics to Jensen's method, emphasized the difficulty in finding the true market portfolio. Since no one knows the composition of this portfolio, the estimate of the Jensen's alpha may be sensitive to the choice of benchmark. (Roll, 1978) In later studies, Grinblatt and Titman (1989, 1994) and Elton et al (1993) provided evidence for the benchmark sensitivity as the alphas in their studies deviated considerably when using different market portfolios.

The second area of criticism targets the statistical bias related to the beta estimate, (Kon and Jen, 1978) (Engström, 2004) referring to Jensen's assumption of a constant beta estimate. In an article written by Fama (1972), it is suggested that a portfolio manager's forecasting skills can be placed

into two distinct categories: 1) forecasts of price movements of individual stocks (micro-forecasting) and 2) forecasts of price movements of the general stock market (macro-forecasting). While a portfolio manager thus can provide superior forecasts both through stock selectivity and market-timing ability, the Jensen measure is only an estimate of the former. The assumption behind the standard Jensen regression even impedes all levels of non-stationarity of the beta estimate. Consequently, the efforts of successful market timers, who accurately predict the general market movements and adjust the portfolio beta accordingly, will not be recognized using the Jensen measure alone. (Grinblatt and Titman, 1989) Jensen (1967) commented on the implications of using a constant beta estimate arguing that the presence of managerial market timing skills would imply a downward biased beta estimate and an upward biased alpha estimate. Thus, successful market timing was suggested to be recognized in the form of a higher alpha estimate. Grant (1977) however demonstrated the contrary, claiming that the beta estimate would be *upward* biased and the alpha estimate *downward* biased in the case of managers possessing market timing ability. Several methods have then been proposed, which aim at measuring fund managers' ability to time the market. Treynor and Mazuy (1966) presented an estimate of a non-linear Security Characteristics Line⁹ (SCL) by adding a squared term to the standard linear index model. The method suggests that a successful market timer will increase the beta (and the slope of the SCL) in bull markets and decrease the beta (and the slope of the SCL) in bear markets, resulting in a curved SCL. Henrikson and Merton (1981) and Henrikson (1984) developed an option-based model, similar to the Treynor-Mazuy model, although less advanced. Instead of adding a squared term to the linear index model, the Henrikson and Merton model includes a dummy-variable whose value is a function of the market return relative to the risk-free rate in a given period. In more recent time, several studies have also been made where the beta is allowed to vary with some predetermined information variables, in contrast to the traditional use of a constant beta estimate. Ferson and Schadt (1996) were two of the first proponents of this method. The basic idea is that the required returns of stocks and bonds to some extent are predictable when seeing the variations in, for example, dividend yields, interest rates and spreads in the corporate bond market. A more thorough discussion about the time-varying beta is found in section 3.4.

⁹ SCL is line displayed in a diagram where the market's excess return is found on the x-axis and the fund's excess return is found on the y-axis. The slope of the SCL is the fund's beta.

The third area of criticism of Jensen's (1967) study is the ignorance of the effects stemming from the exclusion of the non-surviving funds (so called survivorship bias). (Ippolito, 1989) Malkiel (1995) argues that there is a tendency for the successful funds to survive while the less successful funds in some way are driven out of the market. This means that studies that measure the returns of only surviving funds will tend to overestimate the performance of mutual funds. The implications of the survivorship bias are discussed in section 3.5.

Despite the criticism of Jensen's method, the alpha estimation remains the most widely used method for portfolio measurement. (Bodie et al, 2009) (Grinblatt and Titman, 1993) Some academics even downplay the effect of assuming a constant target beta. Grinblatt and Titman (1994) analysed the performance of funds using both the Jensen (1967) and the Treynor-Mazuy (1966) method, and concluded that the former measure performs as well as the latter.

Findings in the American market

Despite the immense literature on performance measurement since the 1960s, no consensus has been reached regarding portfolio managers' ability to achieve abnormal returns through micro- and macro forecasting. Neither Jensen (1967), Treynor and Mazuy (1966) nor Henriksson (1984) found any evidence of managers' forecasting ability in their studies of the US market. For the 115 funds Jensen (1967) examined, only 1 fund showed a statistically significant and positive alpha; i.e. only 1 fund outperformed the market portfolio. Treynor and Mazuy (1966) found only 1 out of 57 funds that demonstrated statistically significant market timing ability. These findings were similar to the ones obtained by Henriksson (1984) almost 20 years later. Henriksson (1984) identified only three funds out of 116 that showed significant market timing in his parametric test.

Ippolito (1989), however, identified 12 significantly positive alphas in his sample of 143 funds when examining fund returns during the period of 1965 to 1984. Although Ippolito (1989) claimed that his findings suggested that managers did demonstrate superior stock picking skills, the results were later questioned in an article by Elton et al (1993), who argued that Ippolito used non-S&P-500 stocks in his sample. When performing the same study including a non-S&P 500 index, the authors found the results to be reverse. Lee and Rahman (1990) found some evidence of micro forecasting and significant market timing for 17 funds in their sample of 93 funds. Yet,

in the Goetzmann, Ingersoll and Ivkovic (2000) study using an adjusted Henriksson-Merton model, no evidence of significant market timing ability for US mutual funds was found.

The older studies mainly focus on the managerial micro- and macro forecasting abilities when assessing fund performance. Yet, in later studies, academics have also estimated the persistence of fund managers' performance. This phenomenon of outperforming the benchmark index in consecutive periods has been named the "hot hands" effect, and a large literature with studies on the US market has been produced. A study by Grinblatt and Titman (1992) documented persistence among good performers, while Carhart (1997) found evidence of persistence among bad performers. Malkiel (1995) found evidence of persistence both among good and bad performers, suggesting that in addition to the "hot hands" phenomenon, also a "cold hand" phenomenon prevails. (Dahlquist et al, 2000) Although the Jensen (1967) study is an exception in that it did not document any performance persistence, Dahlquist et al (2000) suggest that there seem to be some evidence of this phenomenon to exist when seeing the overall academic findings.

Findings in the European market

While there is a vast literature on fund performance of the US market, the studies of European fund performance is relatively scarce. (Blake and Timmermann, 1998) (Christensen, 2005) Similar to the studies made on the US market, the studies made in a European setting have shown mixed results of managers' forecasting ability. Blake and Timmermann (1998) found some evidence of underperformance in the UK market, Cesari and Panetta (2002) reported non-significant alphas net of fees, but strongly positive alphas for gross returns in their study of Italian equity funds. Otten and Bams (2002) performed a study of several European markets and found a general value-adding performance among European fund managers. While German fund managers were not able to produce an aggregated positive alpha net of fees, in all other markets (France, Italy, Netherlands and the UK) managers did indeed demonstrate superior stock picking ability. Yet, only for UK funds, the abnormal return was significant. (Otten and Bams, 2002) Regarding the Danish market, Christensen (2005) found a neutral net of fee performance among Danish mutual fund managers between 1996 and 2003.

Considering the tests made on market timing, Cesari and Panetta (2002) did not find evidence for superior forecasting skills among Italian fund managers. Neither could Christensen (2005)

document any market timing ability in Denmark as almost all gamma coefficients in both the Treynor-Mazuy and Henriksson-Merton model were non-significant.

In studies on performance persistence among European funds, Otten and Bams (2002) found evidence of performance persistence for UK funds. Only a weak persistence was found in the funds of France, Germany and Italy, and the authors believe that these results were due to the rather small number of funds in the sample for these countries. The results of the UK market were in line with the ones obtained by Blake and Timmerman (1998). However, for Danish mutual equity funds, Christiansen (2005) found no evidence of performance persistence.

Studies of the Swedish Fund Market

If relatively few studies of fund performance have been conducted in a non-American setting, the Swedish market has almost been completely ignored by academics. One exception is Dahlquist, Engström and Söderlind (2000) who examined the relation between fund performance and some fund attributes of the Swedish market over the period 1992 to 1997. When computing the alphas net of fees, the authors found significant performance among small equity funds, low fee funds and funds with high trading activity. However, significantly negative alphas were found for equity funds of the public savings programme¹⁰, bond funds and money market funds. Dahlquist et al (2000) reported that the inclusion of non-linear terms or changes in the set of benchmark assets in the regressions as in Treynor–Mazuy (1966) and Henrikson–Merton (1981) did not alter the results. Regarding the persistence in returns, no evidence of this phenomenon was found among Swedish mutual funds. (Dahlquist et al, 2000)

Engström (2004) made another study on the Swedish market where he broke down the fund manager performance into tactical decisions (short-term) and strategic decisions (long-term). Studying 112 Swedish mutual equity funds, Engström (2004) did find abnormal return both for the average Sweden fund and for Small Cap funds relative to the benchmark portfolio.

¹⁰ Swedish "Allemansspar"

3.2 Methods for performance measurement

CAPM and relative performance measures

Perhaps the simplest way to assess portfolio performance is to compare returns within groups of similar investment style and risk characteristics. One could then obtain the relative performance for each portfolio based on a ranking system without making any risk adjustment. However, unless one finds a truly homogenous peer group with similar risk levels compared to the portfolio under investigation, this ranking procedure may well turn out severely misleading. (Bodie et al., 2009) Instead, academics have sought methods that provide adequate estimates of performance adjusted for the portfolio's level of risk. The great breakthrough in performance measurement came shortly after the equilibrium model, CAPM, was developed from articles by Sharpe (1964), Lintner (1969) and Mossin (1966) in the 1960s (Equation 1) $r_{it} - r_{Ft} = \alpha_i + \beta_i(r_{Mt} - r_{Ft}) + \varepsilon_{it}$.

$$E(r_i) = r_F + \beta_i[E(r_M) - r_F]$$

(Equation 1)

Where $E(r_i)$ is the expected return of fund i

r_F is the return on the risk-free rate

$\beta_i = \frac{Cov(r_i, r_M)}{\sigma_{r_M}^2}$ is the beta of fund i with respect to the market portfolio

$E(r_M)$ is the expected return on the market portfolio

Soon after the introduction of the CAPM-model, Treynor (1966), Sharpe (1966) and Jensen (1967) all presented their own approaches for the estimation of risk-adjusted performance based on mean-variance criteria. The findings triggered an explosion of the performance measurement literature, which led to an increased scrutiny of the mutual fund business. (Bodie et al, 2009) Directly derived from the CAPM, Jack Treynor (1966) introduced a risk measure where he compared the portfolio's average return in excess of the average risk-free rate with the portfolio's systematic risk, β (Equation 2).

$$Treydor = \frac{(\bar{r}_p - \bar{r}_f)}{\beta_p}$$

(Equation 2)

The Treynor measure could thus be used as a relative indication of a portfolio's performance compared to other portfolios. The apparent shortcomings of the measure though are that the beta only captures the systematic risk, and that the measure fails to provide any insight into a portfolio's absolute performance. Shortly after the Treynor measure was developed, William Sharpe (1966), later Nobel laureate, presented an alternative reward to volatility measure. In the Sharpe measure, the portfolio's risk is measured by the standard deviation of returns, σ , which is a measure of total risk (Equation 3):

$$Sharpe = \frac{(\bar{r}_p - \bar{r}_f)}{\sigma_p}$$

(Equation 3)

Thus, while the Treynor measure only captures the market risk that a portfolio is exposed to, the Sharpe measure includes both the market risk and the firm-specific risk. The differences between the two measures may well lead to different portfolio rankings, at least for poorly diversified portfolios. (Bodie et al, 2009) Although the Sharpe measure can be seen as an improvement relative to the Treynor measure from this perspective, both measures still suffer from not being able to provide any guidance of the absolute portfolio performance.

Jensen's alpha

Probably the most path-breaking performance measure is Michael C. Jensen's (1967) approach of estimating abnormal return, called α . The α -parameter is an estimate of a portfolio manager's stock picking ability. The Jensen regression is shown in Equation 4.

$$r_{it} - r_{Ft} = \alpha_i + \beta_i(r_{Mt} - r_{Ft}) + \varepsilon_{it}$$

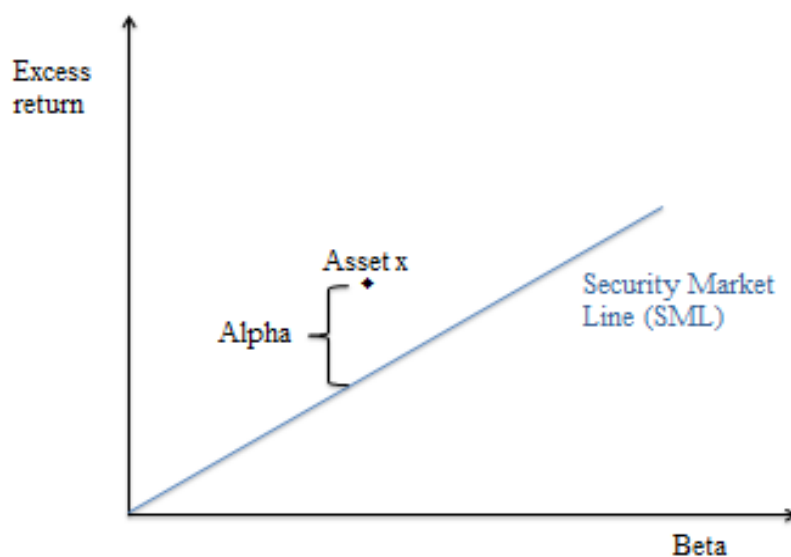
(Equation 4)

In contrast to the Treynor and Sharpe measures, Jensen's alpha is a measure of absolute performance. To emphasize the impact of Jensen's contribution, one can mention that both the Treynor and the Sharpe measure requires a positive alpha in order to display superior

performance relative to the market.(Bodie et al, 2009) Since its development, Jensen's alpha has been the most widely used measure when estimating portfolio performance. (Grinblatt and Titman, 1993) (Bodie et al, 2009) Originating directly from the CAPM with the market return as the only factor, the Jensen method (Equation 4) allows the estimated regression to cross the y-axis in other levels than the origin. (Jensen, 1967) A positive alpha value implies that a portfolio manager is able to generate abnormal returns through successful stock picking. A negative alpha on the other hand means that the manager underperforms relative to the market.

An alternative way of explaining Jensen's alpha is to compare a fund's excess return to the Security Market Line (SML). In Figure 2, a risk-return relation is shown where β is on the x-axis and the excess return is on the y-axis. The alpha-value represents the distance between a portfolio's observed excess return and the Security Market Line (SML). (Bodie et al, 2009)

Figure 2 – Illustration of Jensen's alpha relative to the Security Market Line



Source: Bodie et al. (2009)

One should be aware of that although Jensen's alpha is commonly used to investigate a portfolio's or fund's abnormal performance relative to the market, the alpha itself cannot be used

for portfolio ranking purposes. This, since alphas quite easily can be scaled up by leveraging the portfolio. Thus, a larger alpha does not necessarily imply a higher Treynor measure. (Bodie et al, 2009)

Alternative performance measures

While Jensen's alpha is directly related to the Treynor measure, the M^2 is an extension of the Sharpe measure. Although the Sharpe measure can be used to rank portfolios, the numerical value itself is difficult to interpret. Graham and Harvey (1994) and later Leah and Franco Modigliani (1997) facilitated the interpretation of the Sharpe measure by transforming it into a differential return comparable to the benchmark index portfolio. The intuition behind the derivation of the M^2 measure is to adjust a managed portfolio's volatility to equal the index portfolio volatility by either increasing or decreasing the portfolio portion of a risk-free asset. Once the managed portfolio's volatility has been scaled up or down in this way, the returns of the two portfolios are comparable. The equation for the M^2 measure can also be expressed by the differential of the Sharpe measures for the managed portfolio and the market portfolio, multiplied by the standard deviation of the latter (Equation 5): (Bodie et al., 2009)

$$M^2 = (S_p - S_m)\sigma_m$$

(Equation 5)

Another approach of estimating portfolio performance was suggested by Cornell (1979). He argued that instead of using a benchmark portfolio, one can observe the portfolio composition and return throughout several periods. Cornell (1979) thus introduced a performance measure based on the so-called Event Study Methodology, where asset returns are compared between assets in the portfolio (Event Period) and the same assets being outside the portfolio at a later date (Comparison Period). The underlying idea is that the returns of assets held by an informed portfolio manager will be higher when these assets are inside the portfolio, compared to when they are outside of it. In this method, one can thus observe whether a portfolio manager makes good or bad decisions when altering the portfolio composition. Assume for instance that an equally-weighted portfolio consists of asset x and y at time $t=1$. At the end of this period, all holdings in asset y are sold and the proceeds from the disposal are used to invest in asset z. When time $t=2$ has passed, one can observe if this new portfolio composition is superior to the old

composition by comparing the returns of asset z (in the portfolio) and asset y (outside the portfolio) at time t=2. Using Cornell's (1979) approach in which no benchmark index is required, the debate regarding the CAPM-validation and the existence of a "true" market portfolio is avoided. Grinblatt and Titman (1993) introduced an extension to the Event Study Methodology, which they called Portfolio Change Measure. While the obvious advantage with these approaches is the non-necessity of a benchmark portfolio, the drawback is the great amount of data they require.

Market timing

As it was pointed out by Fama (1972), portfolio managers can outperform the market not only through stock picking ability, but also by demonstrating market-timing ability. There are two fundamental ways of successful timing: 1) Adjust the portfolio weights of equity relative to money-market instruments and 2) adjust the average portfolio beta by altering the weights of high and low beta stocks to better capture market up- and down movements. Both ways have the same underlying feature: adjustment of the portfolio's market exposure in anticipation of market movements. (Elton et al, 2011)

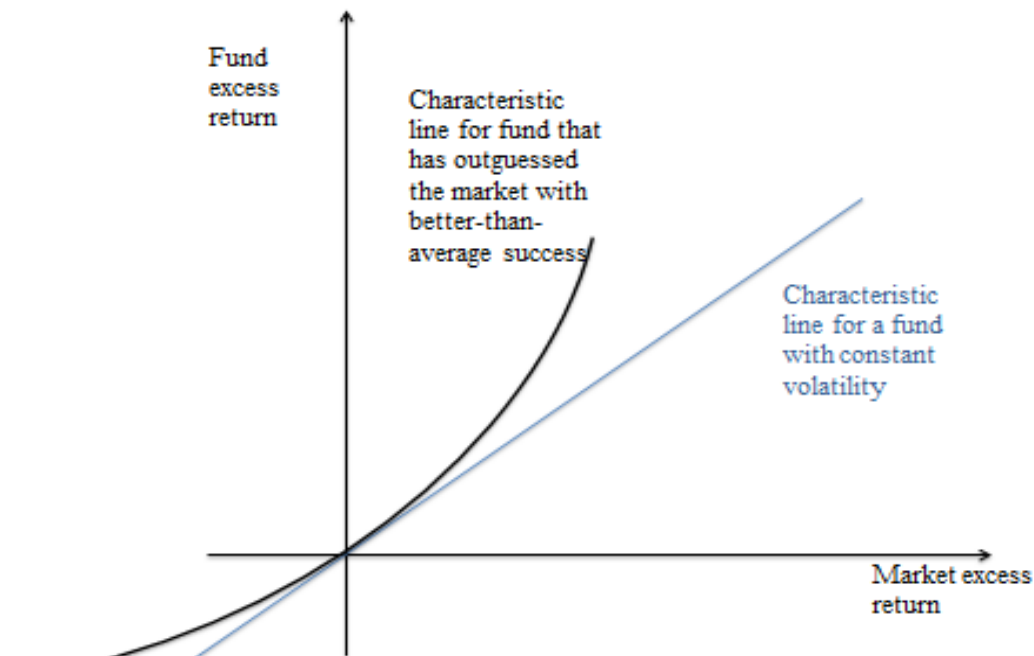
A simple way of testing if a portfolio manager has any market timing aspirations is to perform regressions between the return series of a portfolio and the market at different time periods. If the portfolio manager engages in market timing, the portfolio beta will be non-stationary. Conversely, a manager who overlooks market-timing aspirations would demonstrate a constant beta throughout the observation periods. (Elton et al, 2011) However, the procedure of dividing a time-period into several sub-periods and measure the beta for each sub-period implies several complications. Firstly, the beta estimate for each sub-period would still be constant for that period. (Kon and Jen, 1978) Secondly, this procedure only tells us if the different beta estimates deviate from each other, but provides only little guidance regarding the level of success of any market timing aspirations. To overcome these issues, Treynor and Mazuy (1966) developed a model based on the CAPM-framework to address market timing (Equation 6):

$$r_i - r_f = \alpha_i + \beta_i(r_m - r_f) + \gamma_i(r_m - r_f)^2 + e_i$$

(Equation 6)

Adding a squared term to the standard linear index model, the new γ -parameter assigns a positive value for successful market timers since the characteristic line will become steeper as the market excess return increases, and flatter for negative excess returns (see Figure 3).

Figure 3 - Characteristic line for a market timer and for non-market timer



Source: Treynor and Mazuy (1966)

Henriksson (1984) presented a similar approach based on a model developed by Henriksson and Merton (1981). Instead of using a squared term as in the Treynor and Mazuy model, Henriksson (1984) introduced a dummy-variable, D , which takes the value of 1 if $r_m > r_f$ and 0 if $r_m \leq r_f$ (Equation 7).

$$r_i - r_f = \alpha_i + \beta_i(r_m - r_f) + \gamma_i(r_m - r_f)D + e_i$$

(Equation 7)

where $\gamma_i \equiv \max[0, r_f - r_m]$. In up-markets, the portfolio beta is $\beta + \gamma$, and in down-markets, beta is only β . Another way of explaining the model is by fitting the “up-markets” and “down-markets” in two separate lines. If a portfolio manager possesses market timing ability, the up-market beta ($\beta + \gamma$) should be higher than the down-market beta (β). (Elton et al, 2011) A great

feature with the model is the separate contributions from stock picking and market timing ability. Thus, similar to the Treynor-Mazuy model, the Henrikson-Merton model considers both categories of forecasting skills suggested by Fama (1972). Thereby, it can be seen as an extension to Jensen's (1967) method which only encompasses managers' stock picking skills.

Performance Persistence

As mentioned above, when evaluating fund performance, academics have in addition to the tests of stock selection ability and market timing ability also presented several methods of measuring the persistence of portfolio performance. This is to test whether a portfolio manager who outperformed the benchmark index in one period, also is able to do so in the following periods. Reversely, does a manager who generated negative abnormal returns in one period continue performing poorly in subsequent periods?

Hendricks et al (1993) examined the autocorrelations of mutual fund returns, arguing that significant autocorrelation coefficients imply persistence of returns. Malkiel (1995) followed the Goetzmann and Ibbotson (1994) approach and defined funds as winners (and losers) based on if the fund's return over a calendar year exceeded (or was lower than) the median return. Using the median return as benchmark, the probability of a winner portfolio to continue being a winner should be 0,5 in case of no persistence. The random variable Y , indicating the number of persistent winner (loser) funds, then has a binomial distribution. With a large sample, this distribution can be approximated with a normal distribution with mean equal to 0 and standard deviation equal to 1. Finally, Malkiel (1995) tested whether the probability of remaining a winner (loser) was significantly different from 0,5.

In studies of the European fund market, Blake and Timmermann (1998) constructed a time-series of returns based on each fund's abnormal return (measured by alpha) over the prior 24-month period. Two portfolios including the top and bottom quartiles of funds in the alpha ranking were then constructed and held for 1 month, and then rebalanced again. As a final step, Blake and Timmermann (1998) adjusted the performance of the portfolio by applying Jensen's unconditional regression (Equation 4). Otten and Bams (2002) constructed a similar time-series of returns, but instead of ranking funds according to the abnormal performance, they used the previous 12-month absolute return as a selection tool.

Regarding studies made on the Swedish market, Dahlquist et al (2000) studied persistence of relative performance by including the 1-year lagged Jensen's alpha as an attribute in their regressions. Then the performance was measured by comparing the funds' return in excess of the annual industry average.

3.3 Market efficiency

One of the leading themes in the finance literature since the 1960s is the Efficient Market Hypothesis (EMH). (Elton et al, 2011) The EMH implies that the prices of securities reflect all available information. Thereby, the prices are correct, and it will be impossible for an investor to outperform the market after risk-adjustment. (Bodie et al, 2009) Regarding the role of actively managed funds in an efficient market, Henriksson (1984) argues that the managers will not be able to demonstrate neither stock picking nor market timing skills. The proponents of the markets being informationally efficient thus advocate a passive investment strategy that makes no effort of outperforming the market.

It is common to distinguish between three different forms of the EMH; each related to a certain level of information: (Bodie et al, 2009)

1. *Weak efficiency* – securities prices reflect all historical information. Strategies based on observing patterns in historical prices will not lead to superior investment decisions.
2. *Semi-strong efficiency* – both historical and public information (e.g. from companies' quarterly reports) are reflected in securities prices. Neither technical analysis nor fundamental analysis will help an investor in making his investment decisions.
3. *Strong efficiency* – in addition to the historical and public information, the insider information is embedded in the market prices of securities. Regardless of how informed an investor is, he will not be able to make better decisions than the market.

Ever since its infancy, the theory of the efficient markets has been intensively debated. Indeed, the theory has not been accepted in all academic circles. Many opponents belonging to the Behavioural Finance school have documented a number of so-called market anomalies, giving rise to arbitrage opportunities which are not compatible with the markets being informationally efficient. (Bodie et al, 2009) Examples of the so-called efficient market anomalies are the P/E-

effect (Basu, 1977), the Small-firm effect (Banz, 1981) and the neglected-firm effect (Arbel, 1985).

Grossman and Stiglitz (1980) introduced a modified theory of the efficient markets with costly information. The basic idea is that informed investors earn a sufficient amount to compensate for the cost of information gathering. While the initial version of the EMH would suggest that paying for this additional information is of no use, Grossman and Stiglitz (1980) claim that the extra resources put down do lead to a higher compensation for the informed compared to the uninformed investors. In later studies of fund performance, both Grinblatt and Titman (1989) and Detzler¹¹ (1999) confirmed Grossman and Stiglitz (1980) theory of efficient markets with costly information.

3.4 Un-conditional and conditional models

A necessary condition for the unconditional Jensen measure (and any statistical inference related to it) is that the mutual fund risk level remains constant over time. (Kon and Jen, 1978) While the traditional measure developed by Jensen (1967) assumes that the mean-variance criteria holds, the reality is that means and variances may well differ over time. (Bodie et al, 2009) Jensen (1969) divided his observation period into two sub-periods and found that the correlation coefficient for the betas was 0,74, and interpreted this as enough evidence for the assumption of stationary risk levels to hold. In a later study, Malkiel (1995) confirmed the strong correlation of funds' betas between two subsequent periods. Also Ippolito (1989) divided his time period in two, and performed regressions including a dummy-variable with a value of 1 for one sub-period and the value of zero for the other sub-period.¹² For 15 out of 143 funds in the Ippolito (1989) study, the hypothesis of a stable beta over the two time-intervals could not be accepted. These funds were then simply excluded from the study; although Ippolito(1989) points out that the qualitative results did not differ when including them.

Kon and Jen (1978) however argue that any attempt to subdivide the time-series into shorter intervals will still assume constant betas for such intervals, making such a procedure misspecified. Furthermore, the assumption of a constant beta estimate violates the empirical

¹¹ Study of global bond mutual funds

¹² $R_t - R_{Ft} = \alpha + \beta(R_{Mt} - R_{Ft}) + cD(1975 - 1984) + d(R_{Mt} - R_{Ft})D(1975 - 1984) + error$,

Where R_t , R_{Ft} , R_{Mt} are the fund return, risk-free rate and market return at time t, $D(1975-1984)$ is a zero-one dummy variable equaling unity for the period 1975-1984 (which refers to the second subinterval).

findings of Campanella (1972) who found evidence for the non-stationarity of mutual funds' risk levels. Ferson and Shadt (1996) and Chen and Knez (1996) are proponents of using a conditional model, where variations in the beta are allowed. Ferson and Schadt (1996) point out that a misspecification of the unconditional market timing models perhaps can explain managers' poor micro forecasting skills and negative timing, since time-variation in risk level is ignored. The adding of some pre-determined information variables to the Jensen's unconditional model (Equation 4) has been a common method and is used among others by Dahlquist et al (2000), Otten and Bams (2002) and Cesari and Panetta (2002)¹³. In the conditional model, Z_{t-1} is a vector of some lagged predetermined information variables. Furthermore, when assuming that a linear relation to the conditional information variables can describe the changes in beta, the beta becomes:

$$\beta_{it} = \beta_{i0} + \beta'_i Z_{t-1}$$

(Equation 8)

Using a single index model, the modified Jensen equation is:

$$r_{i,t} - r_{f,t} = \alpha_i + \beta_{i0}(r_{m,t} - r_{f,t}) + \beta'_i Z_{t-1}(r_{m,t} - r_{f,t}) + \varepsilon_{it}$$

(Equation 9)

Effectively, the new regression does not only use the market excess return as the explanatory variable, but also some publicly available information variables that have been proved to be able to predict the required return and risk over time. Ferson and Schadt (1996) used the following information variables in their model: 1) the lagged 1-month T-bill yield, 2) the lagged dividend yield of several American value-weighted stock market indices, 3) a lagged measure of the slope of the term structure, 4) a lagged quality spread in the corporate bond market and 5) a dummy-variable for the month of January. The time period of all lagged information variables is one month. When testing the significance of the individual information variables though, Ferson and Schadt (1996) found that neither the January-dummy nor the corporate bond quality spread

¹³ Appendix 1 shows an overview of the different information variables used by academics in their conditional models.

appeared to be important predictors for the variations in beta. However, the other three information variables proved to be relevant. (Ferson and Schadt, 1996)

3.5 Survivorship bias

A critical issue when assessing fund performance is how to deal with the funds that ceased to exist during the observation period. Sometimes, these funds are merged into another fund, but they can also cease their operations as a consequence of poor performance or of investors' lacking interest. Malkiel (1995) points out that most of the older studies of fund performance are subject to survivorship bias. This implies a drawback of these studies since any analysis will significantly overstate the returns if non-surviving funds are systematically ignored. (Malkiel, 1995) It should come as no surprise that it is difficult to sell a fund with a poor track record. Poor performing funds thus tend to merge with more successful funds, to "bury" the bad record. The tendency is then that only the good performing funds survive in the market (Malkiel, 1995).

However, relatively recent studies by Grinblatt and Titman (1994) and Ferson and Schadt (1996) have been made in which the effect of excluding non-surviving funds is ignored. Grinblatt and Titman (1994) even claim that the estimated survivorship bias in their sample was low, in the region of 0,5% per year. Thus, there are very different opinions regarding how the results are affected when excluding non-surviving funds.

4 Methodology and data

Section 4 describes the methodology of the study. The methodology includes the fund selection procedure, how to derive returns and excess returns as well as how to estimate the market proxy. Furthermore, the section describes the impact of fund expenses, conditioning information and survivorship bias. In addition, a discussion of robustness checks and hypothesis testing are presented.

4.1 Data description

Morningstar provided me with monthly arithmetic returns for the Net Asset Values (NAVs) of Swedish equity funds. The NAVs include reinvested dividends and are calculated as the total fund value net of all expenses divided by the number of fund shares. Since the data covers the period of January 2000 to July 2011, the maximum number of monthly returns for funds that were active throughout the whole observation period was 139. The initial raw data file that I worked with consisted of more than 200 funds, but this number was reduced to a mere 37 funds since many of them did not meet the selection criteria. First of all, all index funds were removed since these are not actively managed. Also Funds of Funds were ignored since these vehicles invest in funds, and not directly in equities. In line with Dahlquist et al (2000), funds investing in foreign markets were excluded. The inclusion of these funds would have required the use of additional benchmarks¹⁴ for foreign markets in order to correctly adjust for the risk exposure. Thus, none of the funds with holdings in both Swedish and Global equities qualified in the study. Funds nominated in foreign currency as well as foreign-registered funds were disregarded since including these funds could bias the results as a consequence of deviating exchange rate development and of (un)favourable tax systems. Donation funds that give away a fixed percentage to charity each year are thought to be too affected by the decrease in NAVs to be comparable for the study. Moreover, similar to the fund selection made by Dahlquist et al (2000), only the funds complying with the UCITS-directive were included. This means that the Special Funds; i.e. funds with less strict guidelines in terms of investment strategies and diversification, were excluded. Apparently, some of these funds invest up to 50% of the fund's value in one single security; others have an extensive use of derivatives or employ other deviating strategies

¹⁴ As in Christiansen (2005)

that are not compliant with the UCITS-regulations. Furthermore, the minimum number of monthly observations was set to 36 (thus 3 years). Funds with less than 36 monthly observations were left out of the final sample. Finally, the study was only made on Large Cap funds. Thus, funds were handpicked according to their target of investments, and those funds investing primarily in Small Cap companies were excluded. Cesari and Panetta (2002) argue that in order to make meaningful studies, funds need to be classified into a homogenous category. The above-mentioned selection criteria are indeed tough, yet it results in a highly uniform sample, which is considered to be a great advantage. It should be noted that no restriction has been set regarding the minimum size of the initial investment.¹⁵ Funds with high initial investment requirements certainly change the target group of customers, yet the magnitude of the initial investment is assumed to have no impact on the fund performance. Table 1 shows the number of funds failing to comply with above-mentioned criteria, as well as the number of funds that qualified for the final sample.

¹⁵ Two Swedbank funds that have an initial minimum investment of 1 000 000 SEK (approximately 110 000 Euros) are included in the sample.

Table 1- Initial number of funds and fund exclusion by category

<i>Initial number of funds</i>	
Category	No funds
Number of funds from Morningstar Raw Data	206
Non-surviving funds	1
Total initial number of funds	207
<i>Fund Exclusion by category</i>	
Category	No funds
1. Passive	20
2. Fund of Fund	4
3. Global	28
4. Foreign currency	22
5. Registered abroad	14
6. Donations	9
7. Special fund	25
8. Too few observations	15
9. Small cap	33
Sum of excluded funds	170
<i>Final number of funds</i>	
Funds to include (207-170) =	37

This table shows the initial number of funds that were considered for the study as well as the number of funds (per category) that did not meet the selection criteria. The last row indicates the number of funds that qualified for the final sample.

4.2 Computation of the return series

The conventional method to calculate returns from historical data is to use geometric returns. Since Morningstar’s raw data consisted of arithmetic returns for the various funds, I created a “base-date” index starting at 100 for each individual fund (Equation 10), and computed the geometric return series from that point in time (Equation 11).

$$Index_t = Index_{t-1}(1 + r_t)$$

(Equation 10)

where $index_t$ is the index value at time t, and r_t is the arithmetic return at time t, including dividends and net of all expenses. This return is expressed as a percentage.

$$Geometric\ return_t = \ln \left(\frac{Index_t}{Index_{t-1}} \right)$$

(Equation 11)

where ln is the natural logarithm.

Using this procedure, a geometric returns series for each fund was constructed. 30 funds were active during the whole observation period and had a complete return series data. 6 funds lacked complete data for the beginning of the observation period and 1 fund lacked complete data for the end of the observation period. For the 37 funds, the return data included on average 129 observations per fund.

4.3 Benchmark

When carrying out studies within the CAPM-framework, the results may be sensitive to the choice of benchmark as argued by Elton et al. (1993) and Grinblatt and Titman (1994). Following the CAPM-critique by Roll (1978), it is difficult to find the “true” market portfolio comprising all tradable securities. With this problem in mind, an issue of distinguishing the portfolio performance from benchmark inefficiency arises. (Roll, 1978) In this study however, the fund managers’ investment opportunities do not span the entire set of securities. Instead, the equity investments are restricted to only target Swedish Large Cap companies listed on the Stockholm Stock Exchange. Indeed, up to 25% of the holdings can be designated to non-equity securities. Yet, since fund managers have a predefined target benchmark in the form of an all equity index, the fund holdings are usually comprised of a relatively low proportion of non-equity securities. For this reason, the so-called market portfolio should be well estimated by a Swedish Large Cap index. Jensen (1967) made an additional test where he took into account that mutual funds are rarely fully invested. In his data, he found that funds on average held about 2 % of their total net assets in cash. Thus, Jensen added the product of this non-equity component and the average yearly risk-free rate to his yearly alpha estimates.¹⁶ While this can be seen as a

¹⁶ Jensen (1967) estimated the average cash holdings and the average yearly risk-free rate to be 2% and 3% respectively. The product, 0,06% was then added to the yearly alpha estimate.

simple and justified way of adjusting the portfolio performance when considering that portfolios rarely consist of 100% equity holdings, there is another important issue to regard. The non-equity holdings do not necessarily imply a burden to portfolio managers; these also provide an opportunity to adjust the portfolio beta in order to capitalize on correct market forecasts. Since this study, unlike Jensen's (1967) original study estimates both portfolio managers' stock picking and market timing ability, the additional adjustment for non-equity holdings is considered to be redundant.

An alternative approach to take height for the non-equity component of funds' holdings is among others used by Cesari and Panetta (2002). In their study of Italian equity funds, the equity proportion was as low as 60% while the government bond proportion amounted to 26%. Therefore, the authors decided to use a two-index benchmark by including a second explanatory variable represented by a value-weighted index of Italian government bonds. While this seems like a reasonable adjustment in these conditions, the equity proportion of Swedish mutual funds *must* exceed 75%. When looking at the funds' holdings as of autumn 2011, the average equity component for the 36 still operating funds was as high as 97%¹⁷. This is a "snapshot" indication of the strongly dominant position of equity holdings among Swedish mutual equity funds (although, the equity proportion may well have been slightly lower in other years during the 11 year observation period). Thus, in line with the study by Dahlquist et al (2000), only the market index will be used as a risk factor in the following regressions.

Another issue to deal with is whether one should use a single index model, or if a multifactor model is preferred. In several well-known early studies on performance measurement, academics have used only one risk factor in their models. Relying on the variations of the market return being able to adequately explain the variations in security returns, Jensen (1967), Treynor-Mazuy (1966), Henriksson (1984) and Ippolito (1989) all used regressions with different forms of the market return as the only factor. Since Fama and French (1993) presented their findings of the 3-factor model, some academics have estimated fund performance using both the single factor and the multifactor approach. In addition to the market return factor, Fama and French (1993) suggest the inclusion of two other factors. These contain the returns of stocks with a small

¹⁷ The fund data of equity holdings come from each fund's most recent fund report. The issue date of these reports vary from fund to fund, ranging from 2011-06-30 to 2011-10-31.

market capitalization minus the returns of stocks with a high capitalization (SML) and returns of stocks with high book-to-market equity minus returns of stocks with low book-to-market equity (HML). Fama and French (1993) argue that this multifactor model better explains the variations in returns in excess of the risk-free rate compared to the single factor model. In more recent studies of fund performance, both Cesari and Panetta (2002) and Otten and Bams (2002) extended their analysis by using the Fama and French (1993) 3-factor model in addition to the single index model. However, there are numerous studies ignoring the additional risk factors (see Malkiel (1995), Ferson and Schadt (1996) and Dahlquist et al (2000)). The reasons to why the Fama and French 3-factor model has been disregarded in this study are several. Firstly, the high R-square (see below) between returns of the funds and the market index I selected only leaves a small room for improvement if adding more risk factors. If an increase of this coefficient of determination would occur as a result of the 3-factor model implementation, it is assumed to only be marginal. Secondly, as mentioned above, several well-recognized studies have been made in which the 3-factor model has been ignored, suggesting that Fama and French (1993) additional factors are not indispensable. Thirdly, the time needed to collect the data for the 2 other risk factors was predicted to be tremendous and beyond the time-frame for this study.

When determining the most appropriate benchmark for this study, five indices were initially considered: MSCI Sweden, OMX Affärsvärlden Generalindex, OMXS, OMXS-30 and SIXPRX. The last mentioned index, SIXPRX, was the one with the highest average R-square (0,946) relative to the geometric return series of the funds in the sample. In addition to being a value-weighted index, SIXPRX both includes reinvested dividends and complies with the same restrictions as the Swedish UCITS-funds. As described above, this means among other things that no security can represent more than 10% of the fund holdings. In the case a company does however constitute more than 10% of the total stock market value, the proportion in excess is allocated pro rata to the other companies, which thereby are assigned a greater share than what is the actual case.¹⁸ Throughout the entire data analysis, the SIXPRX has been used as the benchmark market portfolio.

¹⁸ www.fondbolagen.se

Monthly arithmetic returns for the SIXPRX index were obtained from Bloomberg and from The Swedish Investment Fund Association¹⁹. These returns were later converted into a geometric return series via a constructed index identical to the procedure described in Equation 10 and Equation 11. One issue arose regarding the tax on dividends. While the Morningstar data included the funds' arithmetic returns *after* tax on dividends, the SIXPRX data was presented *before* tax deductions on dividends. Comparing the funds' returns with an index return-series free of taxes would underestimate the performance of the funds. Therefore, I compared the arithmetic returns of the SIXPRX-index with the SIXPX-index (same as SIXPRX but excluding dividends), to see how much of the returns actually stemmed from dividends. This dividend part of the arithmetic return was then multiplied with the Swedish tax rate on dividends. Since the tax rate on dividends (and on capital gains) has been 30% since 1995²⁰, no additional adjustments to the calculations had to be made. Finally, the tax on dividends was subtracted from the SIXPRX-return in order to get the adjusted arithmetic return of the SIXPRX (Equation 12).

$$r_{sixprx\ adj,t} = r_{sixprx,t} - (r_{sixprx,t} - r_{sixpx,t})Tax\ rate$$

(Equation 12)

After the adjustment for tax on dividends, the average R-square between the returns of the 37 funds and the "new" SIXPRX increased to 0,957.

4.4 Risk-free rate

The Swedish seven-day interbank rate was used as a proxy for the risk-free rate, just as in Dahlquist et al (2000). The risk-free rate was first converted to a yearly continues rate, and then divided by 12 in order to find the monthly continues risk-free rate (Equation 13).

$$monthly\ continues\ rf_t = \frac{\ln(1+Swedish\ interbank\ rate_t)}{12}$$

(Equation 13)

Between January 2000 and August 2011, the average continuous risk-free return on a yearly basis was 2,8%.

¹⁹ www.fondbolagen.se

²⁰ www.aktiespararna.se

4.5 Fund expenses

Cesari and Panetta (2002) define three main categories of costs that affect a fund. 1) Bank fees paid to the custodian bank, which acts as a custodian of the fund's assets and take care of operations such as dividend and coupon payments. 2) Management fees – paid each year to the management company as a fixed annual percentage. The Management fee can also include incentive fees, which are additional fees paid out if the management company outperform some pre-determined benchmarks. 3) Trading costs such as brokerage fees and bid-ask spreads that are borne by the funds when making security transactions. In the Morningstar data used for this study, all these costs are included in the funds' NAVs. Thus, no adjustment of the NAV had to be made when calculating the funds' return-series net of expenses.

As a measure of the expenses related to each fund, the Total Expense Ratio (TER) has been used in this study. This measure captures all annual expenses, except the transaction costs, and is expressed as a percentage of the total fund value.²¹ The 2011 average annual TER of the 37 funds used in the study was 1,31% as of August 2011. However, the spread between the lowest and highest TER is indeed large, ranging from 0,4% to 2,5%. Since Morningstar could not provide historical figures for the TER, I have assumed this measure to be constant over each fund's lifecycle.

Cesari and Panetta (2002) stress the importance of measuring performance both net and gross of expenses. Fund savers are logically most interested in the fund's net returns, since that is what they receive at the end of the day. When measuring performance for both net and gross returns, we actually introduce two different perspectives of the study. Using net returns, we measure whether the funds are able to add any value to the final fund saver compared to an investment in a passive portfolio. If we however use gross returns, we actually evaluate the fund managers' investment strategies. When using net returns while considering that the annual TER varies considerably across the funds, the abnormal return of the good (bad) performing funds could simply be a consequence of low (high) TERs. Thus, unless one evaluates the fund performance for both net and gross returns, one will not detect those funds whose managers do possess forecasting ability, yet whose performance is erased due to a high TER.

²¹ www.morningstar.se

For the conversion of net returns into gross returns, I followed the same procedure as Fama and French (2010). Monthly gross returns are calculated as net returns plus 1/12th of the fund's annual TER.

4.6 Information variables in the conditional model

The selection of information variables for the conditional model differs when looking at prior studies on performance measurement. (Prather and Middleton, 2006) In line with Ferson and Schadt (1996), Blake and Timmermann (1998) and Otten and Bams (2002), I chose to include both the lagged yield of the risk-free rate and the lagged dividend yield. For the former, the 1-month STIBOR rate was used as a proxy and for the latter I used the dividend yield of the Swedish Affärsvärldens Generalindex. The use of this index instead of the SIXPRX can be motivated by highlighting that the former better represents the actual dividend yield level of the Stockholm stock exchange, since no restrictions on fund investments are present²². In line with Ferson and Schadt (1996), the lagged measure of the term structure is calculated as the difference between the yield of the Swedish 10-year government bond and the yield of the Swedish 3-month STIBOR. For the lagged market return, the SIXPRX-index has been used. For the sake of consistency, this variable should perhaps have been estimated with the same index as for the dividend yield. However, the R-square for the geometric returns of the SIXPRX-index and the Swedish Affärsvärldens Generalindex is 0,96. Therefore, the choice of one index on behalf of the other should not have any major impact on the results.

The conditional model can also be applied when measuring market timing. Ferson and Schadt (1996) modified the Treynor-Mazuy (1966) model by adding the same set of information variables as to the Jensen (1967) unconditional model. While the gamma still estimates the manager's ability to time the market, the vector, Z, indicates the response of the manager's beta to public information (Equation 14). (Ferson and Schadt, 1996)

$$r_{i,t} - r_{f,t} = \alpha_i + \beta_{i0}(r_{m,t} - r_{f,t}) + \beta_i' Z_{t-1}(r_{m,t} - r_{f,t}) + \gamma_i(r_m - r_f)^2 + \varepsilon_{it}$$

(Equation 14)

²² Yet, the impact on the results when choosing one index instead of the other should be modest due to the high correlation between the two indices.

4.7 Dealing with survivorship bias

For this study, the survivorship bias has posed complications. The data from Morningstar did only include funds that were alive as of July 2011. Thus, funds that were active at some point in time after January 2000 but that ceased to exist before the July 2011 observation are not part of the sample. Since Morningstar could not extract the data for the non-surviving funds, I consulted the Bloomberg and Datastream databases. For some reason, regarding Swedish funds, these databases were much less comprehensive compared to the Morningstar data. Besides, Datastream can in most cases not go back further than to 2006 for Swedish fund data. In the end, two non-surviving funds were found in the Bloomberg database. The data for these funds did however not match perfectly with the Morningstar data. For all observations in March, there was a deviating return in the Bloomberg data due to the non-inclusion of dividends. To see whether the March observations for the years of 2000 to 2011 gave different alphas and betas compared to the other months of the year, a regression using dummy-variables was used (Equation 15).

$$r_t - r_{ft} = \alpha + \beta_1(r_{mt} - r_{ft}) + cD(\text{March}) + \beta_2(r_m - r_f)D(\text{March}) + \varepsilon_t$$

(Equation 15)

For one of the non-surviving funds, Carnegie Sverige, the coefficients for alpha and beta were not significantly different in March compared to the rest of the year. However, for the other non-surviving fund, Banco Kultur, both alpha and beta were different in March.²³ The deviating coefficients for March led to the exclusion of Banco Kultur, and thus only one non-surviving fund (Carnegie Sverige) was included in the study.

The average attrition rate (percentage of funds leaving the sample) in studies of the American fund market is according to Dahlquist et al (2000) around 4,5%. Also the Swedish market showed an attrition rate of about this size between 1993 and 1997 and the majority of funds exiting the sample merge with other funds (Dahlquist et al, 2000). In this study, the funds that have been acquired or merged with other funds are included in my sample as the merged fund, given that the acquirer is already in the sample. Yet, the return history of the acquired fund that ceased to exist under an independent name is discarded in line with the study by Dahlquist et al (2000).

²³ Both statistically significant on a 1% level using the Unconditional model

Despite the fact that some academics downplay the effect of excluding non-surviving funds in the sample (Grinblatt and Titman, 1994), it is likely that the results of the overall fund performance will be biased as argued by Malkiel (1995) A discussion regarding this impact will follow in the Analysis (section 6).

4.8 Robustness checks

When using Ordinary Least Square (OLS) regressions similar to Jensen (1967), no consideration is taken into the potential serial autocorrelation and heteroskedasticity. While the consistency of the coefficient estimates are not disturbed when using the OLS, the standard errors may be misleading. (Dahlquist et al, 2000) The disregard of correcting the standard errors may be especially severe in the Treynor-Mazuy model for market timing, in which a quadratic term is added. (Christensen, 2005) In order to increase the robustness of the tests made in this study, the standard errors have been corrected with the Newey-West procedure. In the performance measurement literature, this correction has among other studies been adopted by Dahlquist et al (2000), Christensen (2005) and Blake and Timmermann (2002).

4.9 Hypothesis testing

When testing for managers' stock selection skills (α) and market-timing skills (γ), we want to investigate whether the α - and γ -coefficients are equal to zero or not. There are two alternative outcomes to the coefficient being zero: higher than zero and lower than zero. This means that the tests throughout the study are 2-sided tests. Thus, while the null-hypothesis is written such that the test-coefficient is equal to zero, the alternative hypothesis is that the coefficient is significantly different from zero. In the case where the coefficient is insignificantly different from zero, we accept the null-hypothesis. Yet, in the case where the coefficient is significantly below or above zero, we reject the null-hypothesis, claiming that the alternative hypothesis is correct. Moreover, we apply the conventional 5% significance level for all tests. With a 2-sided test, the rejection region in each tail of the distribution is thus the outer 2,5%.

Furthermore, the probability of committing a Type-I error; i.e. to reject a true null-hypothesis, is equal to the significance level; i.e. 0,05. (Körner and Wahlgren, 2006) This means that in a sample of 37 funds, one can expect that approximately 2 out of 37 funds appear outside the 95%

acceptance region just by chance. When analysing the results, this information must be born in mind.

In addition to testing the hypotheses regarding stock selection, market timing and performance persistence, a test regarding the model itself will be carried out when applying the conditional model. In this latter test, the purpose is to investigate if the conditional model adds marginal explanatory power to the unconditional model. Practically, this is made by testing whether the coefficients of the four information variables are jointly zero or not. In section 5, the hypotheses are written down to facilitate for the reader.

5 Empirical findings

In this section the hypotheses and the test results are presented. The first part describes the general findings while the second part presents the results from the Jensen regression and from the test between fund expenses and performance. Part three shows the results from the Treynor-Mazuy and Henriksson-Merton models for market timing and part four shows the results from tests of performance persistence.

5.1 General findings

The period between 2000 and 2011 includes both large up and downturns (see Appendix 2). For the 30 funds being in the sample throughout the whole observation period, the average index value as of July 2011 was 141,7.²⁴ This means that over the 11,5 year, the funds created on average 41,7% of value to the fund investors. Yet, the SIXPRX value as of July 2011 was only slightly higher, 144,3. When breaking down these accumulated returns into yearly figures, the average return for the funds becomes 3,05% and for the index 3,2% (see Table 2). Compared to the average yearly return of the risk-free rate of 2,8%, the fund returns must be seen as quite disappointing.

²⁴ Net of expenses and measured by the indexation procedure shown in (Equation 10). Funds that do not have data for the whole observation are not considered since the inclusion of these would imply a start date later than January 2000, and thus measure a different period of return.

Table 2 – Summary statistics of average estimates between January 2000 and July 2011

	No funds/index	Yearly return	Yearly std dev	Beta*	R-Square*	TER
Funds	37	3,05% (4,4%)	21,40%	1,01	0,956	1,31%
SIXPRX	1	3,20%	20,70%	1	1	-

This table reports the summary statistics of the funds in the sample and for the SIXPRX-index. Column 2,3 and 4 show the number of funds/index, average return and average standard deviation on a yearly basis (figure within parenthesis is measured gross of expenses). Column 5 and 6 show the average beta and average coefficient of determination with respect to the SIXPRX-index. Column 7 reports the average annual Total Expense Ratio for the 37 funds. * indicates that the unconditional model has been used.

5.2 Stock picking

The Jensen (1967) regression is the founding block in this study when estimating managers' stock picking ability. In line with Jensen (1967), I assume that the funds in the study are well diversified and that the systematic risk, β , is a good indication of the funds' level of risk. Thus, the non-systematic risk is assumed to be negligible. Similar to Jensen (1967), I run regressions using OLS. To correct for heteroskedasticity in the standard errors, I have used the Newey-West procedure as mentioned before. The regressions are made on a fund-by-fund basis and presented in Table 3. Both Jensen's (1967) unconditional model (Equation 4) and the conditional adjustment (Equation 9) are used. To detect the impact on performance when adding fund expenses, the stock picking ability is measured both for net and gross returns. In addition to this, I carry out a test that estimates the relation between funds' expenses and the performance net of expenses.

Jensen regression – net returns

For the Jensen regression, the null hypothesis is that the alpha is not different from zero while the alternative hypothesis is that the alpha is different from zero. An acceptance of the null hypothesis implies that the fund manager does not have any stock picking skills. Hypothesis 1 is

tested both in an unconditional and a conditional setting. Yet, in order to see if the conditional model adds explanatory power to the unconditional model, I also test whether the coefficients of the four information variables are jointly zero or not (see Hypothesis 2). If the null-hypothesis (of all these coefficients being jointly zero) cannot be rejected, the conditional model is not an improvement of the unconditional model. Yet, if at least one of the coefficients is non-zero, the conditional model adds explanatory power to the unconditional model, and should therefore be preferred.

Hypothesis 1:

$$H_0: \alpha = 0 \quad H_1: \alpha \neq 0$$

Hypothesis 2

$$H_0: \beta_2 = 0, \beta_3 = 0, \beta_4 = 0, \beta_5 = 0$$

$$H_1: \beta_2 \neq 0 \text{ and/or } \beta_3 \neq 0 \text{ and/or } \beta_4 \neq 0 \text{ and/or } \beta_5 \neq 0$$

Table 3 – Yearly fund performance measured by Jensen's alpha (net of expenses)

	Fund name	Unconditional			Conditional		
		α	p-value	R-square	α	p-value	F-prob
1	Aktie-Ansvar Sverige	0,017	0,22	0,96	0,015	0,17	0,19
2	AMF Aktiefond Sverige	0,045*	0,01	0,95	0,042*	0,03	0,00
3	Banco Etisk Sverige	-0,040*	0,00	0,97	-0,037*	0,00	0,90
4	Banco Etisk Sverige Special	-0,034*	0,01	0,95	-0,026	0,06	0,15
5	Banco Svensk Miljö	-0,003	0,76	0,92	0,000	1,00	0,02
6	Carlson Sverigefond	0,000	0,96	0,97	-0,005	0,60	0,43
7	Carnegie Sverigefond	0,022	0,14	0,94	0,018	0,18	0,23
8	Catella Reavinst fond	0,006	0,71	0,93	0,020	0,25	0,13
9	Cicero Sverige Fond SEK	0,001	0,96	0,97	0,004	0,71	0,20
10	Danske Invest Sverige	0,017	0,21	0,95	0,003	0,81	0,01
11	Danske Invest Sverige Fokus	-0,007	0,85	0,79	-0,002	0,94	0,00
12	Danske Invest Sweden A	-0,016	0,25	0,95	-0,030*	0,03	0,12
13	Eldsjäl Sverigefond Inc	-0,012	0,39	0,96	-0,005	0,66	0,00
14	Enter Sverige	0,007	0,44	0,95	-0,001	0,96	0,00
15	Evli Sverigefond	0,001	0,96	0,98	-0,002	0,90	0,30
16	Folksam Aktiefond Sverige	-0,001	0,87	0,98	-0,007	0,27	0,00
17	Folksam LO Sverige	0,001	0,84	0,98	-0,005	0,43	0,00

18	Folksam LO Västfonden	0,007	0,21	0,98	0,001	0,91	0,00
19	Handelsbanken SBC Bofonden	-0,011	0,21	0,97	-0,016	0,11	0,28
20	Handelsbanken Sverigefond	-0,015	0,12	0,98	-0,016	0,12	0,00
21	Länsförsäkringar Sverigefond	-0,008	0,40	0,97	-0,007	0,41	0,00
22	Nordea Etiskt Urval	-0,005	0,64	0,95	-0,010	0,42	0,52
23	Nordea Sverigefond	-0,017	0,10	0,97	-0,013	0,25	0,10
24	Nordea Sweden	-0,023*	0,02	0,97	-0,020	0,06	0,02
25	SEB Etisk Sverigefond Lux UL	-0,021*	0,046	0,93	-0,020*	0,04	0,13
26	SEB Sverige Chans/Risikofond	-0,017	0,17	0,97	-0,011	0,29	0,00
27	SEB Sverigefond	-0,011	0,09	0,99	-0,012	0,05	0,00
28	SEB Sverigefond Stora bolag	-0,016	0,07	0,98	-0,011	0,10	0,00
29	Skandia Aktiefond Sverige	0,005	0,54	0,97	0,000	0,98	0,20
30	SPP Aktiefond Sverige	0,002	0,85	0,97	0,000	0,99	0,09
31	Swedbank Robur Ethica Miljö Sverige	-0,004	0,80	0,93	-0,012	0,47	0,00
32	Swedbank Robur Ethica Sverige MEGA	0,000	0,96	0,98	-0,003	0,71	0,03
33	Swedbank Robur Sverigefond	0,002	0,70	0,98	-0,004	0,56	0,06
34	Swedbank Robur Sverigefond MEGA	0,012*	0,01	0,98	0,005	0,38	0,07
35	Team Catella Tennisfond	0,000	0,98	0,90	0,001	0,97	0,00
36	Öhman Sverigefond	-0,019	0,22	0,96	-0,016	0,27	0,08
37	Carnegie Sverige	-0,022	0,26	0,95	-0,016	0,39	0,03

The table shows the yearly abnormal performance (net of expenses) measured by Jensen's alpha for all funds in the sample. Column 3,4 and 5 report the yearly alpha, p-value of alpha and coefficient of determination for the unconditional model. Column 6,7, and 8 show the yearly alpha, p-value of alpha and F-probability for the conditional model. The F-probability indicates whether we can reject the hypothesis that the coefficients of the 4 information variables are jointly zero. Thus, column 8 is an indication of whether the conditioning information adds marginally explanatory power to the unconditional model. The significance is indicated on a conventional 5%-level. An asterisk (*) indicates that the alpha is significant on a 5% level.

Figure 4 - Frequency distribution of Jensen's alpha (yearly) net of expenses – Unconditional and Conditional model

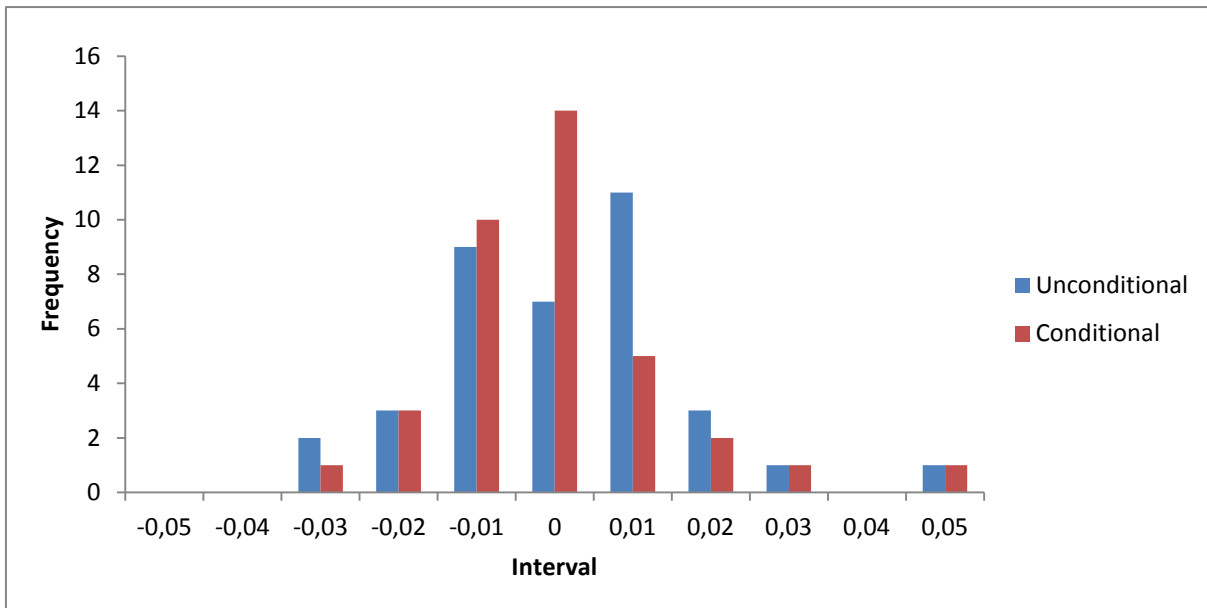


Table 4 - Summary statistics for Jensen's alpha (yearly) net of expenses - Unconditional and Conditional model

	No funds	Alpha	Significantly positive (negative)	Proportion of significant F
Unconditional	37	-0,42%	2 (4)	-
Conditional	37	-0,54%	1 (3)	51%

The table shows the results from the Jensen regressions using the unconditional and conditional models (net of expenses). Column 2 shows the number of funds in the sample and column 3 reports the mean value of Jensen's alpha, measured on an annual basis. Column 4 shows the number of funds whose alphas were significantly positive (negative) on a 5% significance level. Finally, column 5 indicates the percentage of funds for which the test of the 4 information variables was not jointly zero in the conditional model. In other words, it is a measure of the proportion of funds where the conditioning information adds marginal explanatory power to the unconditional model.

From Table 4, we can see that the proportion of funds for which the conditioning information is an improvement of the unconditional model is only 51%. Thus, since it is difficult to say which

model's estimates are most reliable in this case, the results from both models should be taken into consideration when interpreting the results. The estimate of the average yearly alpha is below zero in both models (-0,42% and -0,54% for the unconditional and conditional model respectively). Yet, the great majority of funds have alphas that are insignificantly different from zero. Only for 6 (unconditional) and 4 (conditional) funds, we can reject the null-hypothesis of the alpha being indistinguishable from zero. However, a weak tilt towards the negative end of the alpha distribution can be seen in the two models when considering both the negative average alpha estimate and the comparison between the number of significantly negative and significantly positive alphas.

Relation between fund expenses and performance

The next test investigates if there is any relationship between the fund expenses and performance (net of expenses). As an initial step, I test whether the distribution of alphas is normal or not. Using the normality tests of Jarques-Bera (J-B), Kolmogorov-Smirnova (K-S) and Shapiro-Wilkinson (S-W), the output was the following:

Table 5 - Summary statistics for test of normality - Unconditional and Conditional model

	No funds	Mean alpha	Kurtosis	Skewness	J-B	K-S	S-W
Unconditional	37	-0,42%	1,58	0,47	5,17 (0,075)	0,099 (0,20)	0,969 (0,373)
Conditional	37	-0,54%	2,51	0,77	13,35 (0,001)	0,143 (0,053)	0,945 (0,068)

This table presents three tests for the normality distribution among the alphas (net of expenses) from the unconditional and conditional models. Column 2 and 3 show the number of funds in the sample and the mean yearly Jensen's alpha, and column 4 and 5 show the kurtosis and skewness of the alpha distribution. Columns 6, 7 and 8 display the output of the tests for normality of the alpha distribution using the tests of Jarques-Bera, Kolmogorov-Smirnova and Shapiro-Wilkinson. For columns 6,7 and 8, p-values are reported within parenthesis.

The results from Table 5 show that in the unconditional model, we cannot reject that the alpha distribution is normal. However, in the conditional model, the J-B test clearly indicates that the alphas follow a non-normal distribution. The other 2 tests indicate that, on a 10%-level, the hypothesis of a normal distribution can be rejected.

With the results obtained above, I proceed with the expense-performance tests while assuming that the distribution of alphas is well described by a normal distribution for the unconditional model. Yet, in the conditional model, I assumed that the alphas follow a non-normal distribution (these two assumptions later appeared to have no impact on the results as can be seen below).

The procedure for testing the relation between fund expenses and performance can be explained in several steps. First I ranked the 37 funds according to their TER, ranging from the lowest (0,4%) to the highest (2,5%). Then I divided the sample into quintiles, in order to compare the alphas of the 7 funds with the lowest TER (Group 1) with the alphas of the 7 funds with the highest TER (Group 2) (see Table 6). When looking at the averages of the TERs and alphas for the two groups of funds, we can see that these differ considerably.

Table 6 - Two groups of low-expense and high-expense funds

TER	Group	Alpha (Uncond.)	Alphas (Cond.)
0,4%	1	4,48%	4,18%
0,4%	1	0,11%	-0,47%
0,4%	1	0,72%	0,07%
0,5%	1	1,24%	0,52%
0,7%	1	-0,09%	-0,67%
0,7%	1	0,24%	-0,02%
0,7%	1	0,04%	-0,31%
0,55%	1	0,96%	0,47%
1,7%	2	-1,18%	-0,53%
1,7%	2	-2,23%	-1,57%
1,7%	2	-3,97%	-3,70%
1,7%	2	-0,26%	-0,001%
1,7%	2	0,74%	-0,06%
1,8%	2	-1,57%	-3,00%
2,5%	2	-1,15%	-1,59%
1,83%	2	-1,37%	-1,49%

This table shows the two groups of 7 low-expense funds and 7 high-expense funds. In column 1 the Total Expense Ratio is given. Column 2 indicates if the fund is categorized into the low-expense group (1) or the high-expense group (2). Column 3 and 4 show the funds' yearly alpha estimates from the unconditional and conditional models. Average estimates of the two groups are given in bold.

Unconditional model

For the alphas from the unconditional model, I calculated the average value of the yearly alpha estimates and the respective mean standard error for the two groups of low-expense and high-expense funds (Table 7).

Table 7 - Summary statistics of the two groups of low-expense and high-expense funds

	Group	No funds	Mean alpha	SE mean
Unconditional	1	7	0,963%	0,0061
alpha	2	7	-1,37%	0,0056

The table reports the summary statistics of the two groups of low-expense and high-expense funds for the unconditional model. Column 1 shows the low-expense group (1) and high-expense group (2) and column 2 shows the number of funds in each group. Column 3 and 4 report the mean alpha and the standard error of the mean alpha.

As can be seen in Table 7, the difference between the mean alpha estimate of the two groups is quite large (2,33%)²⁵. Now we want to investigate if this difference is significant. Therefore, the null hypothesis is formed in such a way that the mean alpha ($\bar{\alpha}$) of the low-expense group (1) is not different from the mean alpha of the high-expense group (2). The alternative hypothesis is that the mean alphas of the two groups are different from each other.

Hypothesis 3

$$H_0: \bar{\alpha}_{(Group\ 1)} = \bar{\alpha}_{(Group\ 2)} \quad H_1: \bar{\alpha}_{(Group\ 1)} \neq \bar{\alpha}_{(Group\ 2)}$$

Using the alphas from the unconditional model, I performed an independent samples t-test in order to test for the equality of mean alpha estimates between the two groups. When using an ordinary t-test, a requirement is that the observations are normally distributed and that the variances are equal in the two underlying populations. (Körner and Wahlgren, 2006) The test of normality of the alpha distribution already indicated that we cannot reject that the alphas do follow a normal distribution. And as can be seen in the output of the Independent samples t-test

²⁵ 0,96% - (-1,37%) = 2,33%

(Table 8), the results are very close to identical regardless of assuming equal variances in the underlying population or not.

Table 8 - Summary statistics - Independent samples t-test (Unconditional)

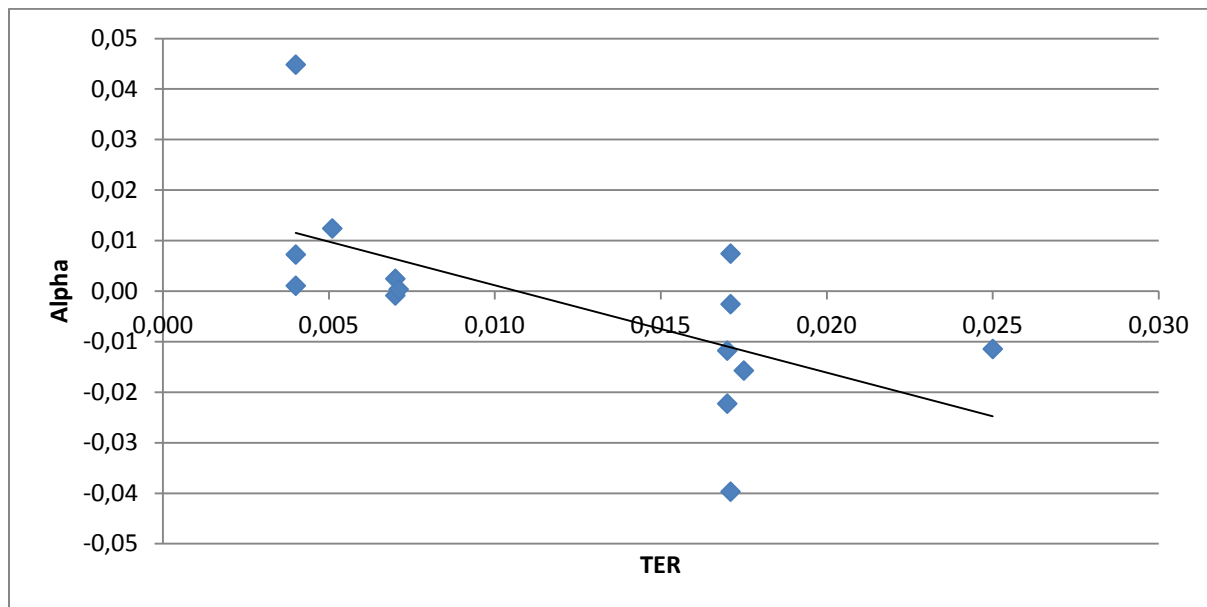
	Df	t-stat	p-value	Mean difference	SE difference
Equal variances assumed	12	2,809	0,016	0,02337	0,008317
Equal variances not assumed	11,92	2,809	0,016	0,02337	0,008317

This table reports the output of the Independent samples t-test when testing the equality of means for the alpha estimates of Group 1 and Group 2. The output is presented both with and without the assumption of equal variances among the alphas. Column 2 shows the degrees of freedom, and column 3 and 4 show the t-stat and the p-value of the t-stat (on a 5% significance level). Column 5 shows the mean difference of alphas between Group 1 and Group 2, and column 6 reports the standard error of the mean difference.

From Table 8 we can see that the mean difference in the alphas (2,337%) of the two groups is significant. The observed t-value of 2,81 is above the critical t-value of 2,18 (for 12 degrees of freedom on a 5% significance level) and the p-value is well below the critical 0,05 level. Thus, we reject the null-hypothesis and say that the low-expense funds (Group 1) evidently have a higher mean alpha estimate compared to the high-expense funds (Group 2)²⁶. A graphical illustration of the relation between expenses and the estimated alphas from the unconditional model can be seen in Figure 5.

²⁶ The results were not altered when performing the same test with alphas from the conditional model. The t-value was 2,35 (p-value = 0,037), indicating that the hypothesis of equal means can be rejected on a 5% significance level.

Figure 5 - Relation between expenses and performance for 14 funds (Unconditional)



This figure shows the negative relation between fund expenses (TER) and the estimated alphas from the unconditional model. The observations are the same as the ones from Table 6; i.e. the 14 observations of the low-expense and high-expense funds.

Conditional model

Now that the negative relation between fund expenses and performance was confirmed for the alpha estimates from the unconditional model, we will test if the same relation prevails when using the alpha estimates from the conditional model. The procedure is similar to the above, yet, the alpha distribution is not normal as we saw in Table 5. Thus, the test of the expense-performance relation needs to be non-parametric. Since the ranking of funds according to their TERs is the same as before, the two groups of low-expense and high-expense funds are not altered. In order to investigate if the alphas of the two groups are significantly different from each other, I used the Mann-Whitney sum-of-rank test. This test is non-parametric and used when analysing two independent samples. (Körner and Wahlgren, 2006) The null-hypothesis is that there is no difference between the distributions of alphas from which the samples are drawn. The alternative hypothesis is that there is a difference between the distributions.

Hypothesis 4

$$H_0: \text{Distribution}_{(\text{Group } 1)} = \text{Distribution}_{(\text{Group } 2)}$$

$$H_1: \text{Distribution}_{(\text{Group } 1)} \neq \text{Distribution}_{(\text{Group } 2)}$$

Table 9 – Mann-Whitney test (Conditional)

Ranks			
Group	No funds	Mean Rank	Sum of Ranks
1	7	9,86	69,00
2	7	5,14	36,00

This table presents the output for the Mann-Whitney sum-of-rank test using the conditional model. Column 1 and 2 shows the 2 groups and the number of funds included in each group. Column 3 and 4 reports the mean rank and sum of ranks for the 2 groups.

Table 10 - Summary statistics - Mann-Whitney sum of rank test (Conditional)

Test Statistics	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
	8	-2,108	0,035

This table reports the test statistics of the Mann-Whitney sum-of-rank test for the conditional model. Column 2 and 3 show the Mann-Whitney U and the respective z-value. Column 4 shows the p-value of the 2-sided test.

When using the alphas from the conditional model, which are assumed to follow a non-normal distribution, the output from Table 9 and Table 10 indicates that the alpha distribution of Group 1 is statistically different from the alpha distribution of Group 2 on a 5% significance level. Thus, we can reject our null-hypothesis, just as we did in the previous independent samples t-test using alphas from the unconditional model. (It should be noted that the results were not altered when performing the same test using alphas from the unconditional model. Thus, the assumption

of what distribution the alpha estimates follows is redundant.) When confirming that the two distributions are significantly different, we also confirm that the alphas of the two groups are significantly different. Therefore, the results from the Mann-Whitney test are in line with the results from the Independent samples t-test.

In order to sum up the results of the tests that investigate the relation between expenses and performance, we can confirm the following. Regardless of using the alphas from the unconditional or conditional model and regardless of a normal distribution is assumed or not, low-expense funds performed significantly better than high-expense funds during the period of observation.

Jensen regression – gross returns

In the next test, we estimate the alphas for the unconditional and conditional model using gross returns. This means that the returns are measured gross of expenses. Similar to the procedure used above for net returns, we want to test both if the fund managers have any stock picking ability (demonstrated by a significant alpha), and if the inclusion of the four information variables results in an improvement of the unconditional model. Thus, the hypotheses are the same as above (Hypothesis 1 and Hypothesis 2)

Figure 6 - Frequency distribution of Jensen's alpha (yearly) gross of expenses – Unconditional and Conditional model

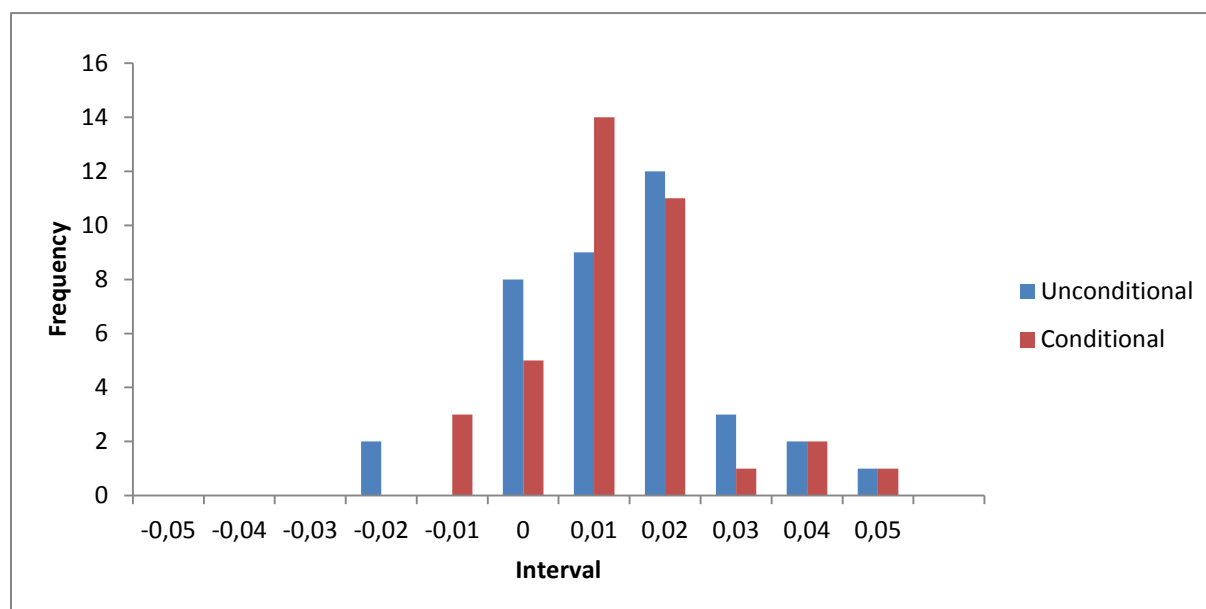


Table 11 - Summary statistics for Jensen's alpha (yearly) gross of expenses - Unconditional and Conditional model

	No funds	Mean yearly alpha	Significantly positive (negative)	Proportion of significant F
Unconditional	37	0,89%	8 (1)	-
Conditional	37	0,77%	4 (1)	51%

The table shows the results from the Jensen regressions using the unconditional and conditional models (gross of expenses). Column 2 shows the number of funds in the sample and column 3 reports the mean value of Jensen's alpha, measured on an annual basis. Column 4 shows the number of funds whose alphas were significantly positive (negative) on a 5% significance level. Finally, column 5 indicates the percentage of funds for which the test of the 4 information variables was not jointly zero in the conditional model. In other words, it is a measure of the proportion of funds where the conditioning information adds marginal explanatory power to the unconditional model.

It comes as no surprise that the proportion of funds for which the conditioning information is an improvement to the unconditional model remains at 51%, just as for the regressions in which net

returns were used. Thus, also for the Jensen regressions with gross returns, the results from both the unconditional and the conditional model need to be considered. What may come as a surprise in Table 11 is the change in the number of significantly positive alphas. In the unconditional model, the increase is from 2 to 8, and in the conditional model it is from 1 to 4 compared the regressions using net returns. The average alphas increase by the average TER-level of 1,3% to 0,89% (unconditional) and 0,77% (conditional). The regression output thus indicates in favour for the fund managers being able to generate abnormal returns before expenses are deducted.

5.3 Market timing

To test whether the fund managers were able to demonstrate any market timing skills, the Treynor-Mazuy and Henrikson-Merton models have been used. In line with Treynor and Mazuy (1966) I used a least-square regression technique to identify any occurrence of a curved characteristic line as shown in Figure 3. The Treynor-Mazuy model is used both in the originally unconditional setting (Equation 6) and in the extended conditional setting suggested by Ferson and Schadt (1996) (Equation 14). Regarding the Henriksson-Merton model, only the unconditional version is used (Equation 7).

Treynor and Mazuy model – net returns

Since the Treynor and Mazuy regression estimates both managers' stock picking and market timing skills, we need to state two separate hypotheses. Just as for the Jensen regression, the null-hypothesis for the alpha estimate is that the alpha is not different from zero, and the alternative hypothesis is that alpha is different from zero (Hypothesis 5).

Hypothesis 5

$$H_0: \alpha = 0 \quad H_1: \alpha \neq 0$$

The fund managers' market forecasts on the other hand are demonstrated in the gamma estimate. As for the test of a significant alpha estimate, we perform 2-sided tests when investigating the significance of the gamma estimate. The null-hypothesis is stated such that gamma is not different from zero and the alternative hypothesis is that gamma is different from zero (Hypothesis 6).

Hypothesis 6

$$H_0: \gamma = 0 \quad H_1: \gamma \neq 0$$

In line with the tests made on managers' stock picking ability, we need to state a hypothesis regarding the potential improvement of using the conditional model. As before, the null-hypothesis is that all coefficients of the information variables are jointly zero. The alternative hypothesis is that at least one of the coefficients is non-zero (Hypothesis 7).

Hypothesis 7

$$H_0: \beta_2 = 0, \beta_3 = 0, \beta_4 = 0, \beta_5 = 0$$

$$H_1: \beta_2 \neq 0 \text{ and/or } \beta_3 \neq 0 \text{ and/or } \beta_4 \neq 0 \text{ and/or } \beta_5 \neq 0$$

Figure 7 - Frequency distribution of the Treynor and Mazuy gamma net of expenses – Unconditional and Conditional model

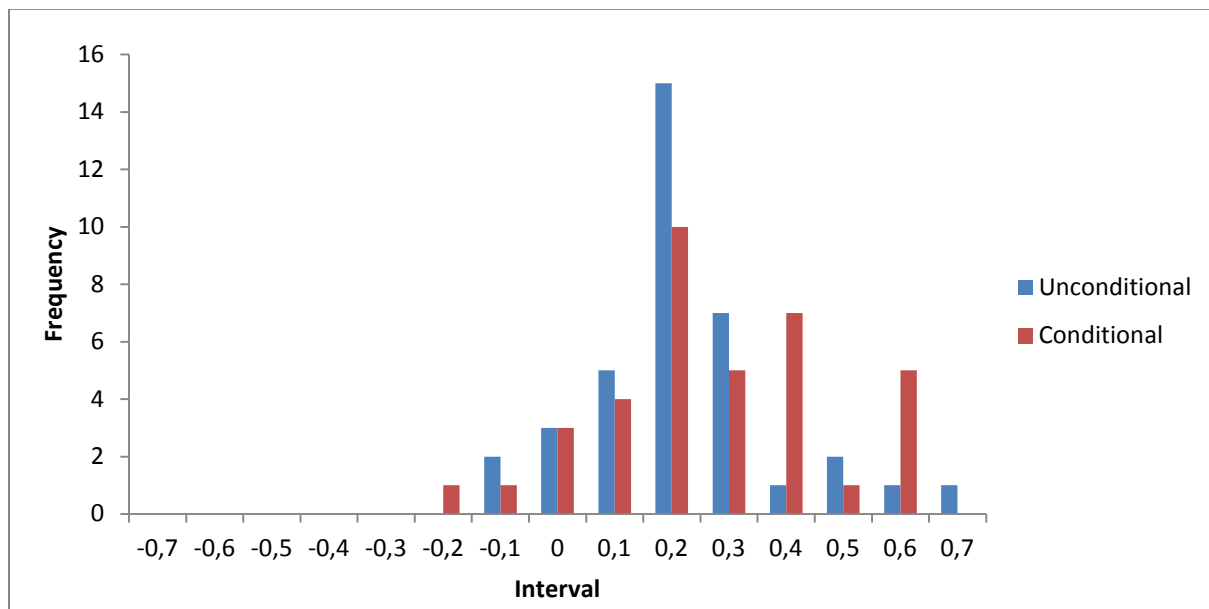


Table 12 - Summary statistics for the Treynor and Mazuy regression net of expenses - Unconditional and Conditional model

	No funds	Mean alpha (yearly)	Significantly positive (negative)	Mean gamma	Significantly positive (negative)	Proportion of significant F
Unconditional	37	-1,15%	1 (9)	0,173	6 (0)	-
Conditional	37	-1,08%	1 (6)	0,218	5(0)	62%

The table shows the results from the Treynor-Mazuy regressions using the unconditional and conditional models (net of expenses). Column 2 shows the number of funds in the sample and column 3 reports the mean alpha estimate, measured on an annual basis. Column 4 shows the number of funds whose alphas were significantly positive (negative) on a 5% significance level. Column 5 shows the market-timing coefficient (gamma) while the number of significantly positive (negative) gammas is found in column 6 (based on a 5% significance level). Finally, column 7 indicates the percentage of funds for which the test of the 4 information variables was not jointly zero in the conditional model. In other words, it is a measure of the proportion of funds where the conditioning information adds marginal explanatory power to the unconditional model.

Table 12 shows that for 62% of the funds, the inclusion of the information variables is an improvement of the unconditional model. Thus, the focus will be on the output from the regressions including the conditioning information. Interestingly, the average alpha estimate is far lower now compared to the one obtained from the standard Jensen regression²⁷ shown in Table 4. Also, the number of significantly negative alphas is larger. For 7 funds, we can reject the null-hypothesis of the alpha estimate not being different from zero. And for 6 out of these 7 funds, the alpha estimates are significantly negative. The results regarding the market timing ability do however give indications in favour of fund managers' forecasting skills. Although, the great majority of fund managers do not demonstrate any market timing ability, 5 gamma estimates are significantly positive, and none is significantly negative. Yet, it appears from the data that 2 out of the 5 funds with significantly positive gammas also have significantly negative alpha estimates in the same regression.

²⁷ These results confirm the argument by Grant (1977)

Treynor and Mazuy model – gross returns

Now we turn our focus to the regression output when using the Treynor and Mazuy model for gross returns. The hypothesis of stock selection and market timing skills are the same as in the previous tests using net returns (see Hypothesis 5, Hypothesis 6 and Hypothesis 7). Table 13 shows the results from the Treynor-Mazuy regression using gross returns:

Table 13 - Summary statistics for the Treynor and Mazuy regression gross of expenses - Unconditional and Conditional model

	No funds	Mean alpha (yearly)	Significantly positive (negative)	Mean gamma	Significantly positive (negative)	Proportion of significant F
Unconditional	37	0,16	3 (1)	0,17	6 (0)	-
Conditional	37	0,22	2 (1)	0,218	5 (0)	62%

The table shows the results from the Treynor-Mazuy regressions using the unconditional and conditional models (gross of expenses). Column 2 shows the number of funds in the sample and column 3 reports the mean alpha estimate, measured on an annual basis. Column 4 shows the number of funds whose alphas were significantly positive (negative) on a 5% significance level. Column 5 shows the market-timing coefficient (gamma) while the number of significantly positive (negative) gammas is found in column 6 (based on a 5% significance level). Finally, column 7 indicates the percentage of funds for which the test of the 4 information variables was not jointly zero in the conditional model. In other words, it is a measure of the proportion of funds where the conditioning information adds marginal explanatory power to the unconditional model.

The results from the Treynor and Mazuy regression (Table 13) using gross instead of net returns show no great surprises. Just as for the regression using net returns, the test of the conditional model indicates that the information variables add explanatory power to the unconditional model for 62% of the funds. Also the number of significant gammas and the average gamma estimate are the same as when using net returns. Thus, the market timing estimates are not affected by the substitution from net returns to gross returns. The difference compared to the net returns regression is instead found in the estimation of the stock picking skills. The average alpha

estimate increases with the average TER of 1,3% to become 0,22%, (-1,08% when using net returns) and the number of significant alphas is reduced from 7 to 3 (2 positive and 1 negative).

Henriksson and Merton model – net and gross returns

In the second model for estimating managers' market timing skills, we substitute the Treynor and Mazuy model for the Henriksson and Merton model. This means that we replace the squared market excess return with a dummy-variable that interacts with the market return as in Equation 7. Also in the Henriksson and Merton model, we estimate the alpha and the gamma coefficients, which represent the estimates of managers' stock picking and market timing ability. The null-hypothesis for the alpha is that it is not different from zero, and the alternative hypothesis is that it is different from zero (Hypothesis 8).

Hypothesis 8

$$H_0: \alpha = 0 \quad H_1: \alpha \neq 0$$

Regarding the gamma-estimate, the null-hypothesis is that it is not different from zero, and the alternative hypothesis is that it is different from zero (Hypothesis 9).

Hypothesis 9

$$H_0: \gamma = 0 \quad H_1: \gamma \neq 0$$

Since the Henriksson and Merton regression is only used in an unconditional setting, the results using net and gross returns are reported jointly.

Figure 8 - Frequency distribution of the Henriksson and Merton gamma net and gross of expenses – Unconditional model

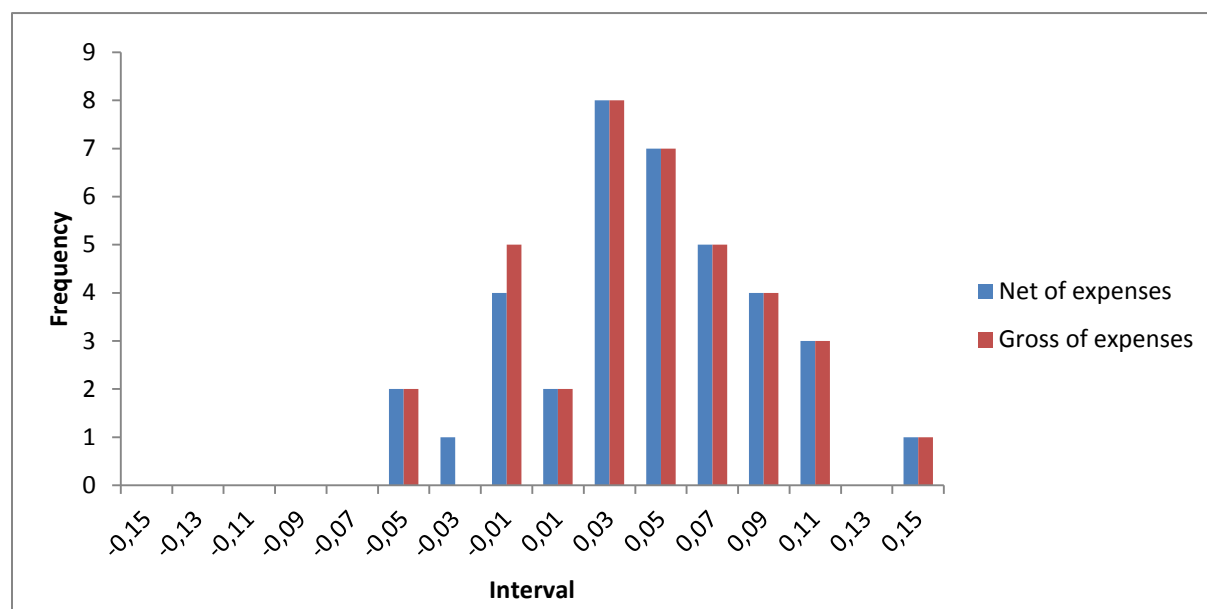


Table 14 - Summary statistics for the Henriksson and Merton regression net and gross of expenses - Unconditional model

	No funds	Mean alpha (yearly)	Significantly positive (negative)	Mean gamma	Significantly positive (negative)
Net of expenses	37	-1,34%	1 (6)	0,035	2 (0)
Gross of expenses	37	-0,03%	2 (1)	0,035	2 (0)

The table shows the results from the Henriksson-Merton regressions using the unconditional models (net and gross of expenses). Column 2 shows the number of funds in the sample and column 3 reports the mean value of Jensen's alpha, measured on an annual basis. Column 4 shows the number of funds whose alphas were significantly positive (negative) on a 5% significance level. Column 5 shows the market-timing coefficient (gamma) while the number of significantly positive (negative) gammas is found in column 6 (based on a 5% significance level).

As can be seen in Table 14, the average alpha estimates are negative for both the regressions using net and gross returns. The difference between the alpha estimates is also in this case the

average expense ratio of 1,3%. The alpha estimates using net returns indeed seem to tilt out of favour for the managers. For 7 funds, we can reject that the alpha is not different from zero, and for 6 out of these 7 funds, the alphas are significantly negative. When looking at the alpha estimates for gross returns however, we find very little evidence of the alphas being different from zero since only 3 out of 37 funds have significant alphas. Turning to the gamma estimates, we can see that these are not affected by the fund expenses. The average monthly gamma is positive (0,035). Yet only for 2 funds (both positive), we can reject the null-hypothesis of the gamma not being different from zero. Thus, there seem to be very weak evidence for managers' market timing ability when applying the Henriksson and Merton model.

5.4 Performance persistence

As a final test of managers' skills, we investigate their ability to repeat the performance over subsequent periods. As it was mentioned above, there are numerous approaches to assess the persistence of portfolio returns. For this study, we will focus on the tests applied by Otten and Bams (2002) and Blake and Timmermann (1998). Using the Otten and Bams test, I ranked the funds according to their absolute performance during the prior 12-month period²⁸. The best performing third was placed in one portfolio, while the worst performing third was placed in a separate portfolio. Each return was given equal weight, and the portfolios were held for one year²⁹. When one year had passed, the portfolios were rebalanced, using the same procedure as above. This generated a time-series of 127 "good" returns and 127 "bad" returns³⁰. When having pooled the "good" and "bad" returns, the final time-series included 254 returns. Next step was to create a dummy-variable with the value of 1 for the "good" returns, and zero for the "bad" returns. Finally, a variable with the dummy interacting with the market excess return was added. The following regression was then used in the unconditional model to test for the existence of persistence:

$$r_t - r_{ft} = \alpha + \beta_1(r_{mt} - r_{ft}) + cD_{Good} + \beta_2(r_m - r_f)D_{Good} + \varepsilon_t$$

(Equation 16)

²⁸ Otten and Bams named this "Selection Period"

²⁹ Otten and Bams named this "Performance Period"

³⁰ The initial number of monthly observations is 139, but since the first 12 observations are only part of the so-called Selection period, the time-series only includes 127 "good" and 127 "bad" returns.

If extending Equation 16 to also include the conditioning information as in Ferson and Schadt (1996), we get the following equation.

$$r_t - r_{ft} = \alpha_i + \beta_1(r_{mt} - r_{ft}) + cD_{Good} + \beta_2(r_m - r_f)D_{Good} + \beta'_i Z_{t-1}(r_{mt} - r_{ft}) + \varepsilon_t$$

(Equation 17)

An indication of persistence is if the two portfolios comprising prior high-return and prior low-return funds show significantly different performance. From Equation 16 and Equation 17, this is the case when the coefficient of the dummy is significant. If the dummy is significantly positive, the prior high-return funds outperform the prior low-return funds. If the dummy on the other hand is significantly negative, the results are reverse. No persistence in any direction is indicated by a non-significant dummy. The null-hypothesis for the Otten and Bams test of persistence is therefore that the estimate of the dummy-coefficient is not different from zero. The alternative hypothesis for the test is that the dummy estimate is different from zero (see Hypothesis 10).

Hypothesis 10

H_0 : Dummy coefficient = 0 H_1 : Dummy coefficient \neq 0

The second test of portfolio persistence is made by following the approach suggested by Blake and Timmermann (1998). Using Jensen's unconditional model, alphas were estimated for each month based on the return of the prior 24-month period. With hindsight to this abnormal performance, the funds were ranked and the highest quartile (good performers) and lowest quartile (bad performers) were put into two separate portfolios. These portfolios were held for one month, and then rebalanced again. Just as in the Otten and Bams (2002) procedure, the returns were given equal weight. Since the first 24 observations were only part of the selection period, the number of returns in the performance period was this time 115 "good" and 115 "bad" returns³¹. When having pooled the "good" and "bad" returns, the final time-series for the combined regression included 230 returns. The same regressions ((Equation 16) and (Equation 17)) as in the Otten and Bams (2002) test were then run.

³¹ 24 observations subtracted from 139

The hypotheses testing when using the Blake and Timmermann procedure is the same as for the Otten and Bams procedure. The null-hypothesis is that the estimate of the dummy coefficient is not different from zero while the alternative hypothesis is that the dummy estimate is different from zero (see Hypothesis 10).

Table 15 – Summary statistics of performance persistence – Combined regressions – Conditional model

	No obs	Alpha (yearly)	p-value (alpha)	Dummy	p-value (dummy)	F-prob.
Otten and Bams (net)	254	-0,74%	0,337	0,09%	0,921	0,0001
Otten and Bams (gross)	254	0,97%	0,227	-0,28%	0,773	0,0005
Blake and Timmerman (net)	230	-0,94%	0,354	0,36%	0,745	0,0011
Blake and Timmerman (gross)	230	0,45%	0,661	0,64%	0,568	0,0000

This table reports the results from the estimates of performance persistence when running combined regressions for prior poor and prior good performing funds using the conditional model. The two models that were used are the ones suggested by Otten and Bams (2002) and Blake and Timmermann (1998). Column 2 indicates the number of observations for each test and column 3 and 4 show the estimated alphas with respective p-values. Column 5 and 6 show the values of the dummy-coefficients (for good returns) and their respective p-values. Column 7 reports the F-probabilities for the test of all information variables in the conditional model being jointly zero. In all tests of performance persistence, the conditioning information adds marginal explanatory power to the unconditional model.

As can be seen in Table 15, only the results from the conditional model are displayed since the conditioning information in all tests resulted in an improvement to the unconditional model (all F-probabilities are well below the critical 0,05 level). The estimates of the dummy-coefficients are all non-significant and range from -0,28% to 0,64% between the tests. Thus, the null-hypothesis of the dummy being indifferent from zero cannot be rejected, indicating that the

performance of prior good performers is not different from prior poor performers. This means that no persistence in fund performance is found.

While the test related to Hypothesis 10 indicates if the performance of prior good performing funds is different from the performance of prior poor performing funds, it does not say if the two individual portfolios outperformed (or were outperformed by) the market. Thus, in addition to the tests on persistence described above, I performed a test in which the returns of the prior good and prior poor performing funds were not pooled together. Instead, separate regressions for the prior winner and prior loser funds were made using Jensen's unconditional model (Equation 4) and the extended model using conditioning information (Equation 9).

The null-hypothesis when using both the Otten and Bams test and the Blake and Timmermann test is therefore that the alpha estimate is not different from zero for both the prior good (Hypothesis 11) and prior poor (Hypothesis 12) performing funds. And the alternative hypothesis for the test is that the alpha estimates are different from zero.

Hypothesis 11

$$H_0: \alpha_{Good} = 0 \qquad H_1: \alpha_{Good} \neq 0$$

Hypothesis 12

$$H_0: \alpha_{Poor} = 0 \qquad H_1: \alpha_{Poor} \neq 0$$

Table 16 – Summary statistics of performance persistence – Separate regressions – Conditional model

	Portfolio	No obs	Alpha (yearly)	p-value (alpha)	F-prob.
Otten and Bams	Net – Poor	127	-0,74%	0,338	0,0001
Otten and Bams	Net – Good	127	-0,65%	0,207	0
Otten and Bams	Gross – Poor	127	0,97%	0,228	0,0007
Otten and Bams	Gross - Good	127	0,69%	0,164	0
Blake and Timmermann	Net – Poor	115	-0,94%	0,355	0,0014
Blake and Timmermann	Net – Good	115	-0,58%	0,192	0
Blake and Timmermann	Gross – Poor	115	0,45%	0,661	0
Blake and Timmermann	Gross - Good	115	1,09%	0,014	0

This table reports the results from the estimates of performance persistence for the Otten and Bams (2002) and Blake and Timmermann (1998) model, when running separate regressions for prior poor and prior good performing funds using the conditional model. Column 2 shows the type of portfolio and column 3 indicates the number of observations for each test. Column 4 and 5 show the estimated alphas with respective p-values. Column 6 reports the F-probabilities for the test of all information variables in the conditional model being jointly zero. In all tests of performance persistence, the conditioning information adds marginal explanatory power to the unconditional model.

Since the conditioning information adds explanatory power to the unconditional model in all tests, only the results from the conditional model are shown in Table 16. As can be seen in the table, the alphas are always negative when using net returns, and always positive when using gross returns. When looking at the p-values of the alphas though, all portfolios except one have non-significant alphas. The exception is the portfolio including prior good-performing funds in

the Blake and Timmermann test for gross returns. When comparing with the results from the same regression using net returns though, one can see that the abnormal performance is consumed by the fund expenses.

6 Analysis

Section 6 contains the analysis of the empirical findings from section 5. The analysis is structured in three parts; stock picking, market timing and performance persistence.

6.1 Stock picking model

Swedish fund managers have performed rather neutrally when considering their stock picking ability net of expenses. The number of significant alphas was only 6 in the unconditional model and 4 in the conditional. The negative performers outnumber the positive performers in both models, yet, only by 4 to 2 (unconditional) and 3 to 1 (conditional). It is furthermore difficult to say whether the conditional model is preferred to the unconditional in this case since the proportion of funds where the information variables appeared to add explanatory power was only 51%.

The results are however very different when looking at the managers' stock picking ability using gross returns. In the unconditional model, 8 out of the 9 significant alphas are positive, and in the conditional model, 4 out of the 5 significant alphas are positive. Furthermore, compared to the regressions using net returns, the equally weighted alpha increases by 1,31% in both models, which also equals the average level of the annual TER for the funds. Although the results from the gross return regressions give an indication of managers' superior stock ability, the fund expenses' impact on performance appeared to be significant. Both tests of diverging performance between low-expense and high-expense funds were significant. Regardless of the conditional model is preferred over the unconditional model, and regardless if the alpha distribution is assumed to be normal or not, low-expense funds outperform high-expense funds on a 5% significance level. When using the unconditional model, the difference in the equally weighted alpha for the two groups is as high as 2,33% on an annual basis. These results are in line with the findings in Dahlquist et al (2000) where low-expense funds appeared to be among the group of good performing funds.

If assuming that the survivorship bias does not have a major impact on the results of managerial stock picking ability, it is tempting to argue that the results from this study confirm the Grossman and Stiglitz (1980) theory of efficient markets with costly information. Fund managers are informed investors who pay for obtaining additional information, and these managers are

able to outperform the market through successful stock selection. However, since the abnormal performance disappears when fund expenses have been subtracted, the fund owners do not reap any benefits from the outperformance. On the other hand, the survivorship bias may have a significant impact when carrying out this kind of studies, as argued by Malkiel (1995). Perhaps the results from a study that includes also the non-surviving funds would have shown a significantly worse outcome of managers' stock selection aspirations, also when performing tests with gross returns. Thus, one should beware of drawing any precipitate conclusions regarding managers' forecasting ability when seeing the results from the gross return regressions.

6.2 Market timing models

When considering the results from the Treynor-Mazuy model, there are indeed some indications of fund managers' timing ability. In the unconditional and conditional model, 6 and 5 funds respectively demonstrated positive and significant gammas, and no fund had a significantly negative gamma. The average size of the gamma-estimate as well as the number of significant gammas is the same regardless of using net or gross returns in the regressions. Furthermore, in the Treynor-Mazuy model for market timing, the conditional model seems to outperform the unconditional model. For 62% of the funds, the coefficients of the information variables are not jointly zero, indicating that these variables add explanatory power to the unconditional model.

However, the yearly alpha estimates in the Treynor-Mazuy model are lowered by around 0,6 percentage points in both the unconditional and the conditional model compared to the results from the standard Jensen regression. When using net returns, the alpha is reduced from around -0,5% to -1,1%, and when using gross returns, the alpha is reduced from around 0,8% to 0,2%. These results confirm the findings by Grant (1977) who claimed that the presence of market timing will simultaneously push down the alpha estimate. In addition to this, when comparing the alpha estimates from the Treynor and Mazuy model with the alphas from the standard Jensen model, the number of significantly negative alphas increases from 4 to 9 in the unconditional model, and from 3 to 6 in the conditional model when using net returns. This occurs while the number of positive alphas is about the same. Moreover, for 2 out of the 5 funds with significant gamma estimates in the conditional model, the alpha estimates are at the same time significantly negative. Thus, the somewhat surprisingly positive results from the market timing estimates are to a great extent vaporized by the simultaneously lowered alpha estimates.

The results on market timing from the Henriksson and Merton model are rather neutral. Only 2 funds showed significantly positive gammas and no fund had a significantly negative gamma. Just as for the results from the Treynor and Mazuy model, the alpha estimates are severely punished in the Henriksson and Merton model compared to the results from the standard Jensen regression. The yearly alphas in the unconditional model are lowered by around 0,8 percentage points for both the net and gross return estimates when comparing with the results from Jensen's alpha regression alone. Thus, also in this case the market timing affects the alpha estimate as argued by Grant (1977). Moreover, the number of significantly negative alphas is destructively affected. In the unconditional model using net returns, the number of funds that significantly underperforms the market increases from 4 to 6 as measured by their yearly alpha estimates.

6.3 Performance persistence models

There seem to be very little evidence of fund managers being able to repeat the performance from prior periods. None of the models used by Otten and Bams, and Blake and Timmermann gave any strong indication of the so-called hot and cold hand phenomenon to prevail. The performance of prior good performing funds cannot be distinguished from the ditto of prior poor performing funds when performing a combined regression for the two groups of funds. The only portfolio that significantly outperformed the market was the prior good performing funds when following the Blake and Timmermann procedure for gross returns. Yet, the abnormal performance obtained if investing in prior good performing funds according to the Blake and Timmermann method will be vanished when the fund expenses are taken into account. Thus, this investment strategy hardly adds any value to the fund saver.

7 Conclusion

This section contains the concluding remarks based on the results and the analysis of the study. It responds to the study's topic of issue and sets the empirical findings in relation to the existing literature on fund performance.

The aggregated fund value and the number of funds on the Swedish market have seen a dramatic increase in recent decades. In a market that assembles huge amounts of investments, there is also a lot of money to make. This has been well recognized among some financial intermediaries who do not hesitate to charge fund savers high expenses in exchange for their asset management services. An annual total expense ratio of 2% may sound justified when considering all the time and resources that the fund managers put down in identifying undervalued companies and in anticipating future market movements. The only problem is that a high level of expenses may well erase any potential abnormal return produced by an informed and successful manager. This study has investigated fund managers' ability in stock selection and market timing, as well as their ability to demonstrate persistence in performance over consecutive periods. The overall results are not impressive. Net of expenses, Swedish fund managers have produced an average annual alpha in the range of -0,5%. However, most alphas are non-significant on a 5% level. When adding additional terms to the Jensen (1967) regression to also encompass fund managers' market timing aspirations as in Treynor and Mazuy (1966), the average alpha turns out increasingly negative. Moreover, out of the 37 funds in the sample, the number of significantly negative alphas from the Treynor and Mazuy (1966) regression is as high as 9 in the unconditional and 6 in the conditional model, whereas the number of significantly positive alphas only is 1 in each model. As what regards fund managers' market timing ability, the gamma coefficient is positive for most funds in the Treynor-Mazuy model, yet only 5 out of 37 gammas are significantly positive. And 2 out of these 5 funds have simultaneously significantly negative alpha estimates. The estimates of managerial stock selection and market timing ability were even more deceptive when using the alternative market timing model proposed by Henriksson and Merton (1981). In this model, the mean alpha estimate is severely punished downwards to an annual level of -1,34% net of expenses, and the number of significantly negative alphas increases from 4 to 6 as compared to the results from Jensen's unconditional

model. At the same time, the estimates of successful market timing strategies could only be statistically confirmed for 2 out of the 37 funds in the Henriksson and Merton model.

When performing the same tests using gross returns, the results for the alpha estimates are very different in all models. Compared to the net return regressions, the average alpha estimate is increased by around 1,3 percentage units, which also corresponds to the average Total Expense Ratio. In the standard Jensen regression, the average alpha estimate is positive and the sum of significantly positive alphas outnumbers the ditto for negative alphas by 8 to 1 in the unconditional and by 4 to 1 in the conditional model. Consequently, it is tempting to conclude that the fund managers do possess superior stock picking skills when expenses are not taken into account. However, this interpretation may be precipitate since we do not know the magnitude of the survivor-ship bias phenomenon. It seems highly reasonable to claim that the exclusion of non-surviving funds will not bias the fund performance downwards; yet, it is quite likely that the performance instead is biased upwards. Thus, while the regressions using net returns point in the direction of a neutral to a weakly negative managerial performance, it is very unlikely that the performance would have been significantly positive if the sample would include both surviving and non-surviving funds. When the results from the gross return regressions indicate managerial outperformance relative to the market, this may be a consequence of 1) successful stock selection strategies among fund managers or 2) the fact that the sample mainly contains only surviving funds. While the former explanation would be a confirmation of the Grossman and Stiglitz (1980) theory of efficient markets with costly information, the latter explanation would confirm Malkiel's (1995) standpoint of unreliable results when the sample is affected by the survivorship bias.

One of the most interesting findings in this study is the relation between fund expenses and performance measured by alpha. Regardless of assuming a normal distribution among the 37 alpha estimates or not, and regardless of using the unconditional model or the extended conditional model, low-expense funds have performed significantly better than high-expense funds throughout the investigation period. In the unconditional model, the difference between the average annual alpha of the group of low-expense funds and the ditto for the group of high-expense funds was as high as 2,33%.

Regarding the performance persistence, there is very little evidence of fund managers being able to repeat their past performance. In the combined regressions using net returns, none of the tests used by Otten and Bams (2002) and Blake and Timmermann (1998) resulted in any significant outcome. Successful managers thus have difficulties in repeating the good performance over subsequent periods, which also implies that past performance is a poor predictor of future performance.

At the end of the day, the net return performance is what matters for the fund saver. When considering the results from this study, it is evident that fund managers have great difficulties in outperforming the market when fund expenses have been taken into account. The study has further confirmed the severe impact expenses have on performance. An inclusion of the non-surviving funds in the sample would perhaps give somehow deviating results, yet this would most likely not be in favour of the fund managers. Thus, the overall conclusion is that the high level of expenses, borne by fund savers when investing in actively managed funds, cannot be justified by the documented performance of the Swedish fund managers. This also means that an actively managed fund with high expenses has great difficulties in adding value to the fund savers.

8 Suggested future research

While a great advantage of the sample of 37 funds is its homogeneity, the main disadvantage is that it leaves out most of the funds that had ceased their operations before the July 2011 observation. A study comprising both surviving and non-surviving funds would give more reliable and robust results compared to the ones obtained in this study.

Moreover, this study only focuses on Swedish mutual equity funds investing in Large Cap companies. It would be interesting to extend the performance analysis by also encompassing those funds investing in Small Cap companies. It may well be that fund managers find it less difficult to identify undervalued companies in the less analysed and less exploited Small Cap sector.

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10 Appendix

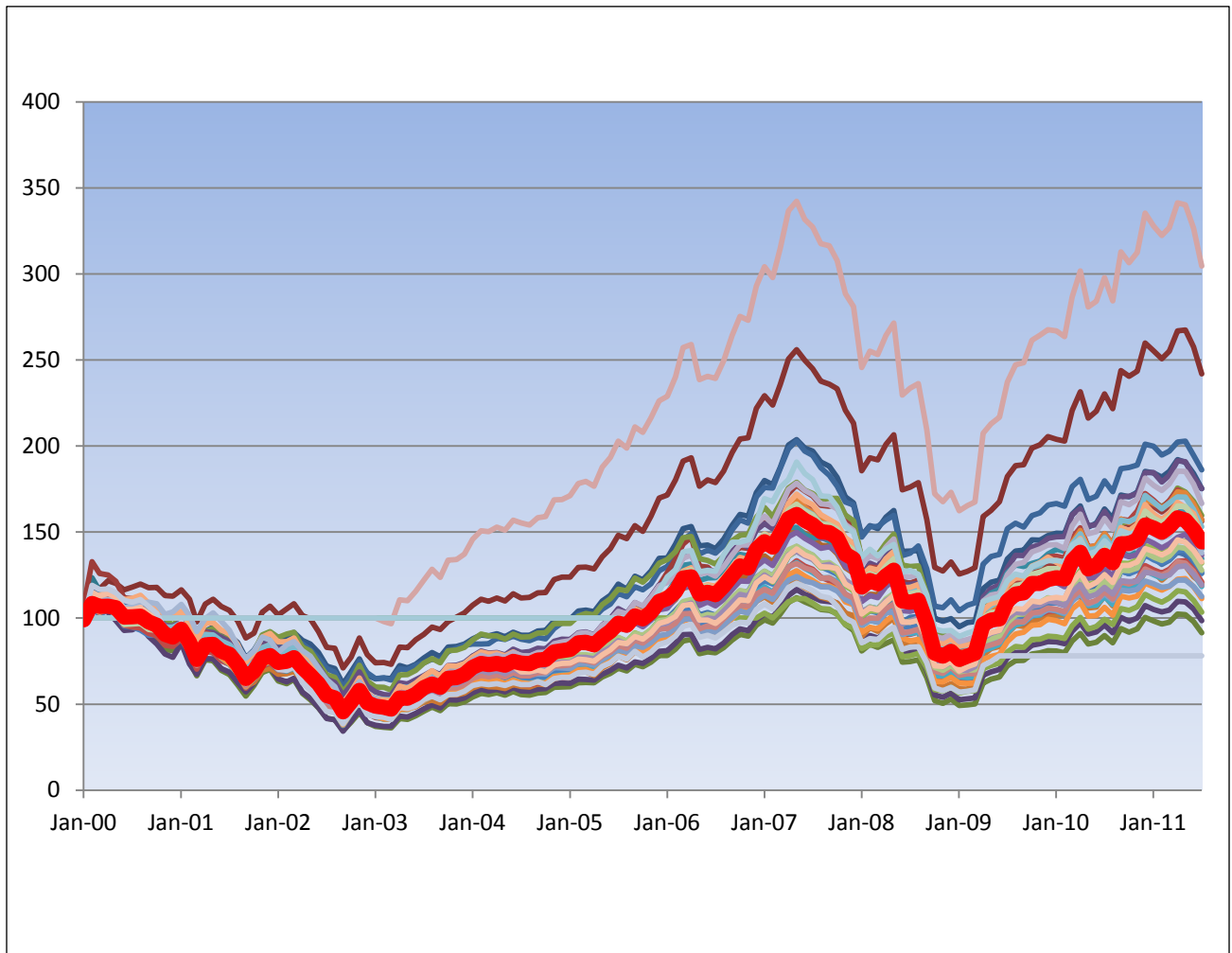
Appendix 1- Information variables used in different studies

Information variables	Ferson and Schadt (1996)	Dahlquist et al (2000)	Otten and Bams (2002)	Blake and Timmerman (1998)	This study
1. Lagged T-bill yield	X		X	X	X
2. Lagged dividend yield	X	X	X	X	X
3. Lagged measure of the slope of the term structure	X		X		X
4. Lagged quality spread in the corporate bond market ³²	X		X		
5. Dummy variable for the month of January	X				
6. Lagged market return		X			X
7. Lagged long-term yield on consols				X	

This table shows how the selection of information variables differs across studies. The X indicates that the information variable is included in the respective study. An empty cell means the information variable is not included.

³² While Ferson and Schadt (1996) used the difference in yield between Moody's BAA and AAA-rated corporate bond yields, Otten and Bams (2002) used the difference in yield between corporate and government bonds.

Appendix 2 – Fund performance using non-logarithmic returns



The figure shows the performance of the 37 funds in the sample as well as the SIXPRX-index (in bold red) between January 2000 and July 2011.