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Active and passive funds: excess returns and persistence in performance

- Evidence from the Swedish fund market 2000-2011 -

Master's Thesis

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Abstract

The purpose of this thesis is to study the performance of mutual funds in the Swedish fund market in 2000-2011. We study whether the active funds performed better than passive funds in terms of abnormal returns. We further study if a fund's historical performance is a direct indicator of the fund's performance in the future by measuring persistence in performance. Our data includes 28 active and 11 passive funds operating in the Swedish fund market. The one-factor (CAPM) and three-factor (Fama and French) benchmark models are used to estimate the excess returns in individual fund and portfolio level. We calculate a linear regression of fund returns in excel and apply performance indices such as Jensen's alpha and Treynor's index. The performance persistence is measured by a separate test including dummy variables as a performance indicator. We concluded that the observed active funds do not generate statistically significant abnormal returns; an investor is better off investing in a passive fund. Further, we discern how some individual funds show persistence in performance as a winner or a loser while no evidence is found for portfolio of funds.

Key words: excess returns, active and passive funds, single index model, three factor model, persistence in performance, Jensen's alpha, Treynor's index

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1. Introduction

This chapter aims to give an introduction for the question at issue by presenting the background, purpose and methodology and finally going through the limitations and outline of the thesis.

The first mutual fund[1] was introduced to the Swedish market in 1958. The demand for mutual funds was very low at that moment and remained low for following twenty years. In 1978 new tax rules regarding financial returns were established which favored investments in mutual funds. The market for mutual funds underwent a change; many new funds were launched and mutual funds became a common form of investment. During the 1990's new regulations regarding public employees' pensions were introduced which made it possible for the individual investor to invest part of their pensions into funds. Approximately 98 % of Sweden's grown up population invested in some fund in 2009 (Strandberg, 2009) with an average investment amounting to SEK 209,000 (Lindmark, 2011).

The availability of different funds has rapidly increased after these changes in regulation. In 1979 investors were able to invest into 17 different funds with a total value of 1 billion SEK. Investors face nowadays over 4,000 different funds; equity funds, fixed income funds, ethical funds and index funds among others. These funds are traded in the Swedish fund market with a total value of 1,200 billion SEK (Fondbolagens Förening). Funds may be passive or active managed. An index fund is an example of a passive fund since it tracks a specific index. A passive fund will always invest in the same assets and same percentage amount as the followed index and the content of the index fund is only changed if replacements are made in the followed index. An active fund differs from a passive fund since a manager supervises the progress of the fund and will alter the fund's content according to changing market conditions. The active funds will generate higher return than passive funds if managers are believed to have superior knowledge or private information of financial assets. The extra services provided by managers make active funds more expensive than passive funds.

Research regarding the performance of mutual funds have been conducted by many academicians e.g. Jensen (1968), Fama & French (1992, 1993) Gruber (1996) Malkiel (1995). According to these studies many active funds unperformed compared to passive funds, especially when fees have been subtracted from returns. These studies indicate that investors

[1] Mutual fund (an active) allows the manager of the fund to invest in a wide portfolio of securities in purpose to generate excess returns (Cuthbertson & Dirk, 2005).

would be better off investing in passive funds. Mentioned studies are performed for global fund markets excluding the Swedish fund market. This study paper extends previous studies by providing current evidence for returns in the Swedish fund market during the years 2003-2011. Additionally, we use the most recent and actual data of the fund returns divided into three different sub-periods of 2003-2005, 2006-2008 and 2009-2011. The different time periods allow us to find empirical evidence of funds' performance at different economical conditions. By dividing our sample period into three sub-periods we are able to consider separately a relatively steady growth period of 2003-2005 followed by an economic upturn and high volatility in 2006-2008 which ended to economical downturn in 2009-2011. The purpose of these divisions is to estimate if different market conditions have an impact of abnormal returns for active and passive funds.

The logic of many investment strategies is to invest in assets that have performed well in the past. Persistence in performance exists if a well performed fund continues to perform well in the future. Persistence in performance may therefore act as an indicator of superior management. According to academic research Grinblatt and Titman (1992), Brown and Goetzmann (1995), Gruber (1996) it is only possible to identify persistence in performance during certain decades. The question remains whether persistence in performance for funds exists or not.

The purpose of this thesis is to examine if active funds generated higher excess returns than passive funds in the Swedish fund market during the years 2003-2011. We also tend to evaluate whether the funds' behavior changes during the chosen years. The question at issue has high importance since 98 % of Sweden's grown up population invest part of their money into funds through pensions. Active managed funds are common form of investments despite evidence from previous research regarding better performance of passive funds.

In this thesis we study if managers at the Swedish fund market possess superior knowledge in order to generate excess returns or if an individual investor would be better off investing in a passive fund. We also evaluate if persistence in performance exists in our sample data. We consider that our thesis provide important findings regarding the level of utility of actively managed funds in the Swedish fund market.

We will use returns from active and passive funds listed in the Swedish fund market during the years 2000-2011. The estimation of fund's performance starts in 2003 and the first three years 2000-2002 of the sample are used as a measurement of the funds historical performance.

The performance of the funds is measured by Jensen's alpha and Treynor index. Jensen's alpha is calculated by using two different benchmark models; the *CAPM* and the *three-factor model* by Fama and French. We test the null hypothesis of alpha equals zero by performing a z-test for respective fund portfolio: Swedish, European, Global and Index. Similarly we perform Z-test to evaluate whether the funds Treynor's index significantly differs from zero. Persistence in performance will be evaluated by the use of dummy variables. The dummy variable takes a value of one if the fund's semi-annual net asset value (NAV)[2] exceeds the semi-annual average of all sample NAV's. The value of one indicates that a fund has generated an abnormal return compared to average returnof the sample. The question at issue regarding persistence in perfomance is to evaluate whether abnormal returns in this period, *t,* will be followed by an abnormal returns period in the next period, *t+1,* as well?

Limitations are necessary since the number of funds in the Swedish fund market has increased to contain more than 4,000 funds. We will in this thesis only focus on mutual funds that have been operational for the whole sample period 2000-2011 in Swedish fund market. We will study both active and passive funds. Limitations regarding the selection of active funds have also been used; we will focus on equity funds investing in three different regions: *Sweden*, *Europe* and *Global.*

This thesis begins with an introducing chapter where purpose, methodology and limitations are briefly discussed. The second chapter introduces the theoretical framework regarding different financial theories of performance measurements of funds. This chapter is followed by previous research, presenting the most important previous academic studies of the topic. Thereafter we introduce the selection of data for the empirical study of funds, and a chapter containing the methodology of the empirical study. Finally, the results of the empirical study will be presented and analyzed.

[2] The Net Asset Value (NAV) is used as fund's return since it provides daily fund return's including management fees of actively managed funds.

2. Theoretical Framework

This chapter begins by giving a brief overview of the theoretical framework for market efficiency. Thereafter the underlying theoretical models are presented such as one-factor and three-factors benchmark models and applied performance measures. Since the mentioned models are used in this thesis, the following chapter provides an important framework for a reader to understand following chapters.

2.1 Efficient market

The possibility to predict future prices and achieving excess returns in the capital market depends on the degree of market efficiency. Active funds are more expensive than passive funds since it is believed that fund managers have superior knowledge or private information, of the financial market. The degree of efficiency affects the possibility for managers to buy undervalued assets in order to generate excess return. The capital market is according to Fama (1970 p. 384) considered to be efficient if *prices fully reflect all available information*. The capital market may therefore be divided into three different categories depending on its efficiency; *weak*, *semi strong* or *strong efficient.*

The weak form of market efficiency exists if the price of a security reflects all historical prices. The only way to cause a price change is the release of new information (Fama 1970, p. 390). The semi strong form of market efficiency exists if prices fully reflect past prices and all public information. Price adjustments should occur immediately after the publishing of new public information if the market is semi strong efficient (Fama 1970, p. 404).

The strong form of market efficiency unable the investor to achieve excess return by the use of insider information. It is not possible to predict future prices and achieve excess returns by the use of past prices, public information or private information if the market is strong efficient (Fama 1970, p.409). The degree of market efficiency affects managers' possibility to predict future prices. Public information is available for all investors. Managers may due to their position have better access to private information than other investors and may be classified as superior managers if their investments gain excess returns.

2.2 Benchmark models

2.2.1 Capital Asset Pricing Model – CAPM

Capital Asset Pricing Model (CAPM) was established in 1964-1965 by William Sharpe and John Lintner. CAPM has been the essential measure of expected return and risk relation of a financial asset during the past 40 years (Grinblatt et al, 1994). CAPM implies a linear relation between the expected return of an asset and the asset's covariance with the market portfolio (Campbell et al, 1998, p. 181). Sharp and Lintner developed the CAPM by developing Markowitz (1959) research regarding mean-variance efficient portfolios. In Markowitz model the investors are risk averse and care only about the mean and variance of asset returns for one period. Markowitz's mean-variance-efficient portfolio is the portfolio which 1) minimizes the variance of the portfolio, given expected return and 2) maximizes expected return given variance (Fama et al, 2004, p. 26). Sharpe and Lintner added two key assumptions to Markowitz's mean variance model in order to develop the CAPM; investor's *complete agreement of prices* and *borrowing and lending of the risk free rate* R_f. The expected return of an asset i is estimated by following equation:

$$E[R_i] = R_f + \beta_{im}(E[R_m] - R_f)$$

where $$\beta_{im} = \frac{Cov[R_i, R_m]}{Var[R_m]}$$

In the expected return equation, $E[R_i]$ represents expected return on asset *i*, β_{im} is asset *i*'s beta and $\left(E[R_m] - R_f\right)$ is the excess return of the market portfolio. The beta on asset *i* is the slope coefficient of the risk adjusted return on the market portfolio (Fama et al, 2004, p. 26). The returns are assumed to be independent and identically distributed (IID) and all efficient portfolios include a risk free asset due to risk free lending or borrowing. It is also possible to find a single risky tangency portfolio, *the market portfolio*, by Tobin's separation theorem. (Fama et al 2004, p.26). The fundamental idea behind CAPM is that the return of an asset depends on the asset's riskiness. There exists a positive relationship between risk and return and the investor is only rewarded for the undiversifiable risk which is measured by the beta value (Gruber et al 2011, p. 137-139).

CAPM is widely used in academic and business purposes due to its straightforward implementation and intuitive prediction of asset returns. However, the efficiency of the market portfolio is based on many unrealistic assumptions such as *complete agreement, unrestricted borrowing or lending with a risk free rate* and *unrestricted short-selling* of a risk free asset (Fama et al, 2004, p. 30). Thus, numerous studies have been conducted from 1970's and forward to find empirical evidence for CAPM's mean-variance efficient market portfolio,

for example by Black (1972), Fama and Macbeth (1973) and Blume and Friend (1970). However, criticism has later arisen of different anomalies as size, earnings-price, debt-equity and book-to-market-ratios of the CAPM by Basu (1977), Banz (1981) and Fama and French (1992, 1993).

2.2.2 Fama and French's three factor model

Eugene Fama and Kenneth French (1992, 1993) developed the traditional one-factor CAPM to a three-factor model of expected return based on the results of several empirical studies (e.g. Fama and French (1992, 1993), Basu (1977), Banz (1981)) of betas incapability to explain cross-section of stock returns and the effects of firm's size, leverage and book-to-market ratio. Fama and French argue that small, leveraged and high book-to-market firms generate higher stock returns and these factors should for that reason be seen as compensation for additional risk that is excluded from one-factor CAPM. Therefore the market beta alone is not sufficient to capture the risks of a portfolio and the assumption of a mean-variance-portfolio is not valid. Additionally Fama and French argue that variables like size and book-to-market equity are proxies of financial distress and therefore measure the firm's risk. Fama and French's three- factor model of expected returns is presented below (Fama et French, 2004, p. 38):

$$E[R_{it}] - R_{ft} = \beta_{iM}\left(R_{Mt} - R_{ft}\right) + \beta_{is}E(SMB_t) + \beta_{ih}E(HML_t) + \varepsilon_{it}$$

The factors are chosen as returns on portfolios constructed according the following characteristics:

$\left(R_{mt} - R_{ft}\right)$: represents the excess return of market portfolio.

SMB_t (small minus big): represents the size effect, the difference of returns between small and large stocks in a portfolio.

HML_t (high minus low): represents the difference of returns of high book to market stocks and low book to market stocks.

If the intercept alpha equals zero for all assets *i* the model captures the variation in average return for portfolios formed on size, book-to-market equity and other price ratios. The time series regression alpha measures how stock prices respond to new market information and captures the level of information of portfolio managers (Carhart, 1997).

Carhart (1997) developed the four-factor model including a momentum effect which is not explained by either CAPM or Fama and French's three factor model.[3] The four-factor model takes difference of winner and loser short-term returns of diversified fund's into account.

2.3 Performance measurements

2.3.1 Jensen's Alpha

Jensen's Alpha is a risk-adjusted measurement of portfolio performance that estimates how much a manager's forecasting ability contributes to the fund's return (Jensen, 1968, p. 389). The estimated abnormal return is the positive difference between actual return and the return predicted by CAPM. Jensen's alpha should equal zero if CAPM is used as a benchmark since the market risk, beta, is a sufficient explanatory factor of assets returns. Superior managers exist only if alphas significantly differ from zero. Jensen's alpha is estimated from the formula below:

$$E[R_{it}] - R_f = \propto_i + \beta_i\big(E[R_{mt}] - R_f\big)$$

CAPM is the traditional benchmark model for the estimation of Jensen's alpha. Multifactor models have in recent years been used more frequently as additional benchmark models on account of CAPM's incapability of estimating expected returns.

2.3.2 Treynor Ratio

The Treynor ratio (1965) is the left hand side of the following equation:

$$\frac{E[R_i] - R_f}{\beta_i} = E[R_m] - R_f$$

Treynor ratio measures the asset's excess return per unit of undiversifiable risk. The Treynor index is a critcal measure since it proves the existence of CAPM. The CAPM will only hold if beta is positive, and the value of Treynor ratio is positive for all portfolios. The Treynor ratio is used as a historical performance measurement, where high Treynor index indicates good performance (Cuthbertson et Nitzche, 2005, p. 174). The active fund manager over-perform the market portfolio if TR_i is higher than the excess return from the market portfolio ($tr_i > E[R_m] - R_f$). This may happen if the market is not in equilibrium, otherwise the Treynor index will be the same as the excess return from the market portfolio.

[3]Momentum effect: "Fund's that perform well in relation to market over the last three to twelve months continue to perform well for the following months and vice versa (Fama et French, 2004, p. 39)".

3. Previous research

Following chapter presents previous research considering excess returns of active and passive funds. We summarize the methodology, result and conclusion of several study paper by academicians such as; Martin Gruber, Stephen J Brown and William N Goetzmann, Burton Malkiel and Mark Grinblatt.

3.1 Returns of active and passive funds

A large number of researches concerning the performance of mutual funds have been published the past 50 years. Michael Jensen (1968) evaluated the performance of 115 mutual funds in the U.S. during the years 1945-1964. One way to evaluate whether fund managers possess forecasting ability is to study the performance of existing funds and compare this to the return of a benchmark model. Jensen used the CAPM as a benchmark model and indicated the distinction between returns from a benchmark model and returns from active funds as the alpha value. The fund returns should exceed returns from the benchmark model if a manager possesses forecasting ability. Jensen studied the performance of the 115 funds using the gross and net return of the chosen funds. The null hypothesis in his research was that the alphas did not differ from zero. Jensen was able to show that the funds on average had a negative alpha when net returns were used. In this case the funds, after paying for expenses, had performed worse than they should have done due to the funds exposure to systematic risk. The distribution of the alphas was skewed to the left; the probability of investing in a fund with a negative alpha was higher than investing in a fund with a positive alpha. The funds were also studied individually. 14 funds had significant negative alphas at 5% level. Only 3 funds had significant positive alphas at 5 % level. The alphas are more distributed to zero when testing for gross returns. Fund managers in this study were on average not able to forecast security prices to generate excess returns.

Burton Malkiel (1995) studied the return of active mutual funds in the US during the years 1971-1991. The mutual funds had on average negative alphas when net returns were used and positive alphas when gross returns were used. Though, these alphas did not differ significantly from zero, and the null hypothesis regarding an alpha equal to zero could not be rejected. Malkiel also studied the funds individually. The null hypothesis regarding the individual alphas equal to zero could be rejected. Malkiel's estimations resulted in more significant negative alphas than significant positive alphas when net returns were used. An equal number of significant alphas that were either positive or negative were found when gross returns were

used. Malkiel (1995) also performed single cross sectional regression to find out if a significant relationship existed between the return of the funds and the annually expenses an investor had to pay the fund manager to evaluate whether size of the expense had an impact on the return of the chosen funds. The service provided by a superior manager should be more expensive than if the same service was provided by an inefficient manager. Malkiel found a significant negative relationship between annually expenses and the net return of the funds. The expense ratio was also split into two parts, advisory expenses and non-advisory expenses and multiple regressions were performed to see if these had an impact on return of the funds. Advisory expenses resulted in a positive relationship and non-advisory expenses resulted in a negative relationship. The multiple regressions were however insignificant. Malkiel (1995) concluded that the returns of the active funds did not generate returns high enough to cover the fees of the active funds. Expensive funds were not positive related to the performance of the funds. An investor would be better off just investing in an index fund.

Martin Gruber (1996) compared the performance from active equity funds and passive funds during the years 1985-1994. Gruber used Jensen's index to calculate excess returns for the funds. Three different benchmark models were used to calculate the alpha values; *the single index model*, *the four index model* and *the difference between the return of the fund and the return of the market*. Gruber concluded that the equity funds underperformed all benchmark models; they should have given higher returns due to their exposure to systematic risk. The low return generated by the equity funds resulted in an average beta of 0, 96. It was in this case better to invest in a fund striving to mimic the market portfolio. The active funds underperformed the four index model on average by 65 basis points. The fees proved to be higher than the value added by the managers. Gruber also estimated alpha values for the index funds. The index funds had on average better alphas compared to the equity funds. They were also available for lower fees. Regressions were also performed to evaluate how closely the index funds follows the indices they try to mimic, this resulted in an average R^2-value of 0,999. An individual investor would therefore be better of investing into an index fund since these funds follow the market more closely, generate higher risk adjusted returns than active funds and are cheaper than active funds.

Gruber's conclusions corresponded with results of previous research, even though his results partly differed from previous studies. This is mostly explained by Gruber's choice of benchmark models. Indices are used in the benchmark models to calculate the funds' theoretically return. The stocks in the indices and in the active funds differed a lot during the

measurement period. Indices that represented the market portfolio tended to hold larger stocks and equity mutual funds tended to hold smaller growth oriented stocks. It is necessary to take this into consideration since smaller and larger stocks generate different returns, the differences between the mutual funds and the benchmark models would otherwise only consist of differences in returns for the stocks not included in the indices. The four factor model decreased this difference and is therefore the most reliable benchmark to use to get correct and reliable results. The four index model consisting of four different indicators proved to be useful and explained 89 % of the variability of the active funds. The CAPM had mostly been used as a benchmark model in previous researches.

Thomas P. MCGuigan (2006) has studied the performance of active and passive funds in North America 1983-2003. MCGuigan used rolling windows of 10 years each. Of these 11 rolling windows only 10, 59 % of the active funds generated higher returns than the index fund. MCGuigan also proved that the length of the investment period affected the ability to beat the index fund. An increase in the investment period decreased the probability of managers to beat the index fund. Several active funds in the sample performed worse than the index fund. The probability of choosing a fund that performs better than the index fund is low and it is also very expensive to make investments into bad funds. During the entire period only 1 fund beat the index fund all years and only 17 % of the active funds beat the index fund six times or more. Investments should therefore be made in both passive and active funds, but only if investors believe the active fund will beat passive funds. Investors are therefore recommended to invest 80 % in passive funds and 20 % in active funds.

Bauer, Otten and Rad (2006) discuss whether managers actually possess additional information to achieve excess returns or if the excess returns are explained by momentum factors? Bauer et al use the CAPM and the multifactor model as benchmark models. The benchmark models are used both conditional and unconditional. The funds are measured individually and as a group. When the CAPM is used as a benchmark model Jensen's index is negative for all fund groups while the alphas differ a lot when the funds are treated individually. Many of the equity funds have alphas that significantly do not differ from zero. For this reason it is not possible to prove that the equity funds statistically performed worse than the passive funds. The balanced funds have significant negative alphas. The four factor model reveals the same result as the CAPM, balanced funds underperform significantly and equity funds have insignificant alphas close to zero. The results are the same whether a conditional or unconditional model is used; the alphas become negative or insignificant from

zero if fees are subtracted from returns. The alphas change if gross returns are used. Equity funds achieve a positive alpha while the balanced funds achieve a negative alpha. Since these results are insignificant the null hypothesis regarding alpha equal to zero cannot be rejected. This means that active funds generate returns as high as they should according to their exposure of systematic risk, but due to the higher fees of the active funds the net return of the funds will be negative. Bauer et al were as previous researchers unable to prove that managers possess superior knowledge of the financial market that will generate excess return for the active funds.

To summarize; the presented studies share some common main results even though the results of these studies partly differ; some managers may add value to active funds but due to the high fees the net return of the funds will be negative. Several studies showed that the active funds underperformed the market or underperformed due to degree of undiversifiable risk. An individual investor is therefore better off investing in an index fund since the fees are lower and generate higher excess returns compared to active funds.

3.2 Persistence in performance

Another issue regarding active and passive funds is the existence of persistence in performance. Many investment strategies are based on past performance. Investments are made in assets that performed well in the past but will they continue to perform well in the future? Persistence in performance may be an indicator of superior management and may act as an argument for active managed funds

Grinblatt & Titman (1992) studied 279 mutual funds during the years 1974-1984. The measurement period was divided into two sub periods, consisting of five years each. A regression was performed to evaluate if the returns of the first sub-period had a significant impact on the returns of the later subsample. Grinblatt & Titman could in their study show that some sort of persistence in performance existed in the fund market. Past returns could be used as a measure for future investments.

Brown & Goetzmann (1995) evaluated persistence in performance during the years 1977-1989. A winning fund was a fund that generated a return higher than the average performance of the funds. The performance measurement and test for persistence was performed annually. It was possible to find 7-8 years that showed the existence of persistence in performance of the twelve years evaluated. It was also possible to find the opposite for some years, winning

funds in the first period became losers in the second period. Brown & Goetzmann (1995) concluded from these findings that persistence in performance is correlated across managers though this phenomenon was dependent on which years to study. There is according to this study no superior manager who possesses special knowledge or private information. Future research in this area should therefore be concentrated in studying common strategies managers usually take.

Martin Gruber (1996) develops another view on persistence in performance. Gruber sorted the funds into 10 deciles based on different measures such as past returns, expenses or alpha values and then calculated the performance of the deciles the next period to come. Gruber was able to prove that persistence in performance exists. Alpha values as a predictor for future investments give the highest excess return and are also statistically significant at 1 % level and is therefore the best predictor to use. Funds are usually sold at NAV excluding managers' performance and thus the investors buy funds for the NAV irrespective of the quality of the managers. Persistence in performance can according to Gruber only be found if superior management exists and if management is not priced. Some researchers state that the performances of the managers are included in the fees. Well performing managers will charge a higher price for their services. If this is true then persistence in performance does not exists. By studying the fees for the deciles every year Gruber (1995) found that high expenses were not a sign of superior management. Persistence in performance may therefore exist.

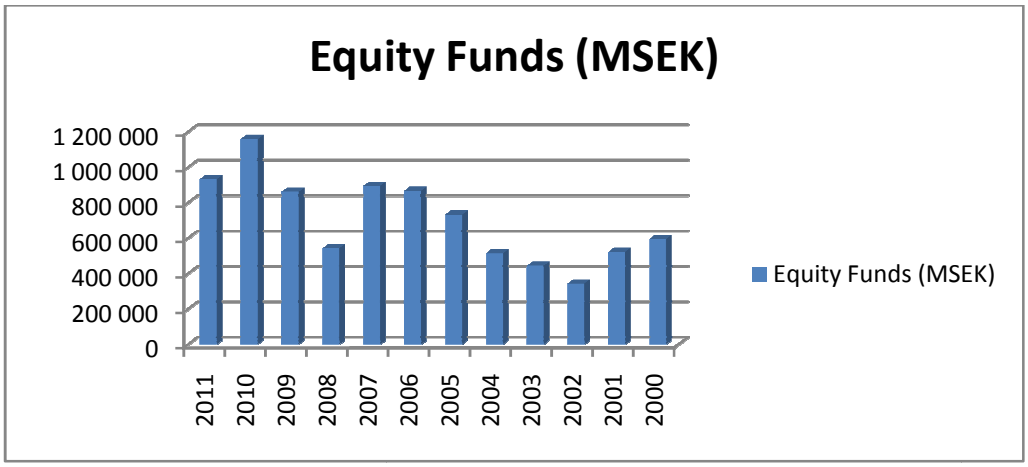
Burton Malkiel (1995) performed tests for persistence in performance for funds during 1970's and 1980's. A fund was defined as a winner if it generated a return higher than the average during the specific period of time. The null hypothesis regarding no persistence in performance could be rejected in 1970. Winning funds in the selection period turned out to be winner in the performance period as well. Losing funds tended to lose in next period as well. Malkiel could not reject the null hypothesis during 1980. Different investment strategies resulted in excess returns in 1970's but not in 1980's. As previous researcher Malkiel (1995) concluded that persistence in performance exists but only during certain time periods.

4. Data

This chapter introduced the data we use in the empirical research.

4.1 Selected sample

The data of this thesis provides fund returns of 28 actively managed equity and 11 passive funds operating in 2000-2011 in the Swedish fund market. We evaluate the return of the funds during the years 2003-2011. The first three years of data (2000-2002) are used as historical benchmark. We divide our sample period to three different sub-periods including three different economic conditions. Our purpose is to study different economic conditions influence for active versus passive funds. The question is interesting due to existing evidence that active funds have advantages in economic downturns since managers are able to replace the contents of the fund (Zheng, Wang & Zheng, 2009). We consider that years of 2003-2005 represent a relatively stable growth period in Swedish economy, while 2006-2008 is a combination of economic boom and huge volatility, which ends to economic slowdown in 2009-2011. Some limitations in data selection have been made since the amount of funds has increased enormously in the past 30 years from 17 available funds in 1979 to over 4 000 funds in 2009. The development of monetary value of equity funds in Sweden is presented in graph 1. Many different fund styles are represented in the Swedish fund market. We will in this thesis concentrate us on passive funds, represented as index funds and active funds represented as equity funds. We will also study three different markets of equity funds: *Swedish*, *European* and *Global* funds.



Graph 1: The amount of equity funds in Sweden (MSEK)[4]

[4] http://www.fondbolagen.se/sv/Statistik--index/Nysparande-i-fonder/

4.2 Net Asset Values (NAV)

Net Asset Values have been collected from Handelsbanken's database[5]. The database provided NAV on a daily basis for a period of 2000-2011. Only those funds that have been operational for the whole sample period are included in our empirical work. The chosen funds are presented in appendix table 8.

4.3 Benchmark model factors

We apply the benchmark model factors provided by Kenneth French's data library in our thesis. Fama and French constructed six value-weighted portfolios and estimated benchmark factors for the period of 1927- 2011. The risk free asset represents one month U.S. Treasury Bill rate from Ibbotson Associates.[6] We consider U.S. Treasury bill rate as a reliable measurement of a risk free asset return and since our returns are estimated in monthly basis, the monthly Treasury yield is suitable to be applied in our benchmark model. Fama and French provide global index representing value-weighted returns on all NYSE, AMEX and NASDAQ stocks[7]. We consider global index most reliable for our benchmark models since international funds are represented in our sample. The loading factors and index are created from some of the world's biggest and most powerful economical markets; these factors are therefore preferable to use in the benchmark models to get general and reliable results. The SMB represents the average return on the small portfolio minus an average return of a big portfolio as the HML represents the average returns of two neutral portfolios minus the average return of two growth portfolios.[8]

[5] http://www.handelsbanken.se/
[6] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[7] Data is collected from the Center of Research in Security Prices (CRSP), http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[8] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[8] http://www.eastcapital.com/sv/faq/kurser-kurssattning/vad-betyder-nav

5. Methodology

A central topic in finance is the performance of financial assets and how to correctly measure performance. Part of the methodology of this thesis will be based on Brown and Goetzmann (1995) and Gruber (1996). We focus on using the Jensen's alpha and Treynor index as performance measurements. These performance measurements are derived from the traditional Sharpe-Lintner (1964, 1965) Capital Asset Pricing Model. The CAPM as one factor model assumes that the market beta is sufficient to explain return of financial assets. Due to the findings of Fama and French (1992, 1993) we will extend the analysis to include a multi factor model as an additional benchmark model. The alphas and Treynor index are estimated individually for each fund and later compared to an average of all funds for respective; Active, Swedish, European, Global and Passive funds.

5.1 Actual returns

The NAV represents the funds course and is calculated by first, subtracting administration costs from the asset, and then dividing it by the number of outstanding shares[9]. Actual return for asset *i* is calculated on a monthly basis as the difference between the present NAV and the past NAV, divided with the past NAV as in the formula below:

$$\frac{NAV_t - NAV_{t-1}}{NAV_{t-1}} = Re_i$$

5.2 Jensen's alpha

Jensen's alpha will first be estimated in the traditional way by the use of CAPM. We use the formula below to estimate the alphas in our thesis (Cuthbertson et al, 2005, p.175).

$$R_{it} - R_{ft} = \propto_i + \beta_i(R_{mt} - R_{ft}) + \varepsilon_{it+1}$$

We will in this paper interpret the alpha as a measure of managers' ability of generating excess returns. We will use the same interpretation of alpha values as Barras, Scaillet and Wermers (2005):

1. $\propto_i < 0$, funds that have underperformed
2. $\propto_i = 0$, fund returns equal index

3. $\propto_i > 0$, funds that have over-performed

CAPM has been the subject of much criticism under the past 40 years. We will therefore use an additional benchmark model when estimating Jensen's alpha. Due to the findings of Gruber (1996) and Fama and French (1992, 1993) a multifactor model is used as an additional benchmark model when estimating Jensen's alpha. The three factor model by Fama and French is presented below:

$$R_{it} - R_{ft} = \propto_i + \beta_{iM}(R_{Mt} - R_{ft}) + \beta_{is}E(SMB_t) + \beta_{ih}E(HML_t) + \varepsilon_{it}$$

We perform a linear regression of fund returns to estimate Jensen's alpha, in which abnormal returns can be explained either by unexplained return ($\propto_i$) or by the error term (ε_{it}). The error term is minimized by the ordinary least square method. We start by estimating market, SMB and HML beta values and thereafter we calculate Jensen's index for each fund by using both one-factor and three-factor model as a benchmark.

5.3 Treynor's index

Treynor's Index is calculated by using each fund's market beta in the denominators and the risk adjusted actual return in the numerator, as shown in equation below:

$$\frac{R_i - R_f}{\beta_i} = R_m - R_f$$

We compare the Treynor's index against the risk adjusted return from the market portfolio to evaluate whether managers possess special knowledge. When the market is in equilibrium the difference between Treynor's index and markets risk adjusted return should equal zero. Hence if Treynor index is higher than adjusted market return a fund provides an abnormal return.

5.4 Statistical inference

The alpha values will be inferred by conducting a Z-test. We will test a multiply regression including all active and passive funds and three different sub groups. The one sided hypothesis is presented below.

$H_0: \alpha_i = 0$ $H_1: \alpha_i > 0$ Where i=1,2,3..,N.

The alpha is used as a measure to find portfolios that generate abnormal returns. The statistical test for Treynor index reveals whether the Treynor's index differs from the risk adjusted return of the market portfolio. We use $tr_i = mkt - rf$ as null hypothesis for the

Treynor index and test it against the alternative hypothesis of Treynor index exceeding the risk adjusted return of the market portfolio. The fund returns must approximately be normally distributed if the Z-test is conducted. Therefore we start by calculating skewness and kurtosis of returns. The skewness should equal zero and kurtosis should approximately take a value of three if the data is classifed as following a normal distribution. The skewness and kustosis of the funds are presented in appendix tables 9-10. The skewness is approximately 0 and we will therefore conduct Z-test to test our hypothesis. To be able to test the hypothesis we construct five different fund portfolios. The first contains all active equity funds without any further ordering, the four following portfolios are Swedish, European, Global and Index funds separately. To apply Z-test we calculate the variance for respective portfolio and for each sub-period: 2003-2005, 2006-2008 and 2009-2011. We test the null hypothesis of alpha equals zero and if z-test provides a p-value less than 0, 05 we reject the null hypothesis with 5 percents significant level. This test is applied for the one-factor and three-factor Jensen's alphas as for Treynor indexes for each fund.

5.5 Persistence in performance

We estimate whether it is possible to detect persistence in performance during the measurement period by evaluating performance of a fund for a semi-annual level for the sample period of 2000-2011. This method provides 24 observation of each fund. We estimate cross-sectional average returns individually for all funds and for each separate group. The same methodology is applied to index funds as a separate group. We use the same methodology as Brown and Goetzmann (1995) by defining a fund as a winner if its semi-annual return exceeds the average semi-annual return of all funds in the sample group. A winning or losing fund will be estimated by dummy variables, where the dummy variable take the value of 1 if the semi-annual return exceed the average semi-annual return in the sample group, the dummy variable will in all other cases take the value of 0. A fund will be classified as a winner if the semi-annual returns exceed the sample semi-annual returns 12 times or more. Analyses will then be performed to evaluate the funds' performance during the measurement period.

6. Empirical results

We present the results of our empirical study. First, the Jensen's Alpha and Treynor Index are measured utilizing one-factor (CAPM) and three-factor model (FF3) for each sample portfolio: Active, Swedish, European, Global and Index funds. The alpha estimates are calculated in 3-year basis for three sub-groups covering the whole study period of 2003-2011. Then, we extend alpha calculations to cover each fund individually in purpose to discover if some funds generate abnormal return among the portfolio of funds. The last part of the empirical work is to perform tests regarding persistence in performance. We apply a regression including dummy variables where a dummy takes a value of one if the return of the fund exceeds the average return in the sample group.

6.1. Estimating excess returns for a portfolio of funds

6.1.1 Jensen's alpha and Treynor's difference for active funds

We have used Jensen's alpha and Treynor's index as performance measures to detect whether active funds generates higher excess returns compared to passive funds. Table 4 summarizes the results of Jensen's alpha and Treynor's difference for active funds:

		Average values	p-values
2009-2011			
	Alpha CAPM	-0,52 %	76,55%
	Alpha three factor	-0,83 %	82,82 %
	Treynor differens	-0,87 %	88,62 %
2006-2008			
	Alpha CAPM	-0,36 %	73,03 %
	Alpha three factor	-0,34 %	70,70 %
	Treynor differens	-0,51 %	80,30 %
2003-2005			
	Alpha CAPM	-0,16 %	60,70 %
	Alpha three factor	-0,03 %	51,87 %
	Treynor differens	-0,87 %	64,07 %

Table 4: Average alpha values and p-values for the active funds

The table illustrates how alphas of each sub-period are insignificant at 5 % significance level. However, the average alphas differ in size depending on sub-group and benchmark model. The highest alpha is found when FF3 is used as benchmark model in the first sub-group (2003-2005). Additionally, the lowest p-value is reached for the same observation thus still being highly insignificant. The average alphas for respective benchmark model are very similar in values in 2006-2008. It is worth to notice that the average alphas for the active

funds are very small; no alpha is higher than 1 percent. We do not reject the null hypothesis of alpha equal to zero since all alphas are statistically insignificant.

Our second performance measure is difference between Treynor's index and the excess return from the market portfolio. The null hypothesis of no difference between the Treynor's index and the excess return of market portfolio cannot be rejected for the alternative hypothesis since the differences are negative and close to zero. To sum up: we do not observe any evidence of abnormal returns neither by the use of Jensen's alpha or Treynor's index.

6.1.2 Jensen's alpha and Treynor's difference for different active portfolios

After studying the portfolio of active funds we briefly discuss the empirical results of three portfolios of funds defined by regional sub-groups. The purpose is to analyze whether funds invested in certain investment region performed better than others. Tables 11-13 in appendix summarize the results of alphas and Treynor's differences for portfolios investing in Sweden Europe and globally. We find consistent results for all three portfolios regarding Jensen's alpha and Treynor's index. None of the portfolios have significant alpha values or Treynor's differences at 5 % significance level. The highest alpha value is always generated by the three factor model in 2003-2005 in relation with the lowest p-value. Trend in values are close to zero for all portfolios and in many cases also negative, although the lowest alpha values are always found in 2009-2011. The Treynor's indexes reveals the same pattern as the alphas; close to zero and insignificant at 5 % significance level. Therefore we cannot reject the null hypotheses that Jensen's alpha and Treynor's difference both equal to zero. These results are expected since it is unlikely that all three different sub portfolios would generate abnormal returns if the active funds on average were unable to do it.

6.1.3 Jensen's alpha and Treynor's difference for Passive funds

As presented in previous paragraphs none of the portfolios of active funds provide excess returns or positive Treynor differences at statistically significant 5 % level. We will now study the alphas and Treynor indexes for the portfolio of passive funds. The summarized performance indicators of passive funds are presented in the table 5:

2009-2011		Average values	P-values
	Alpha CAPM	-0,29%	75,18%
	Alpha three factor	-0,51%	80,71%
	Treynor differens	0,36%	42,47%
2006-2008			

2003-2005	**Alpha CAPM**	-0,50%	88,09%
	Alpha three factor	-0,46%	84,81%
	Treynor differens	-2,40%	89,91%
	Alpha CAPM	-0,05%	54,14%
	Alpha three factor	0,22%	33,23%
	Treynor differens	0,08%	44,74%

Table 5: Average alpha values and p-values for the passive funds.

We notice a similar trend in alpha estimations as in previous sample groups. Especially the alphas of passive and active funds are relatively equal in the whole time period 2003-2011. Highest alpha is once again reached in 2003-2005 when the FF3 model is used as a benchmark. Additionally the Treynor's difference generates positive returns for two sub-groups though these differences are still insignificant at 5 % significance level. The Treynor's differences are highly negative in 2006-2008 and particularly the passive portfolio underperforms in this period. The conclusion remains in line with previous ones as we cannot find statistically significant evidence of superior management according to Treynor's index or Jensen's alpha.

6.2 Estimating excess returns for individual funds

Additionally the tests of significance are performed to estimate funds individual returns for each sub-period. Again the p-values differ significantly between the funds within each sample groups, benchmark model and sub-group. The purpose of next paragraphs is to carefully summarize the results at individual fund level of active and passive funds.

6.2.1 Jensen's alpha and Treynor's difference for individual active funds

The alpha values and the difference between Treynor's index and the risk adjusted return of the market portfolio for the individual funds are presented in appendix tables 14. The individual active funds show the same behavior as the portfolios; the alphas are on average negative and insignificant for all periods. None of the alpha values are significant at 5 % level. Only two European funds generate positive alphas, which significantly differ from zero, when 10 % is used as significance level. These alphas are generated in 2003-2005. The p-values regarding the alpha values for individual funds differ a lot between different sub-periods and it is impossible to discover similar patterns for any specific group; all funds have p-values between 10 % - 98 %. Some funds show positive difference between the Treynor's index and the risk adjusted return of the market portfolio. The positive differences are in

general small and close to zero. The lowest p-value lies at 5, 8 % for a fund that also generates the highest difference between the Treynor's index and the market.

6.2.2 Jensen's alpha and Treynor's difference for individual Passive funds

The individual alpha values and differences between the Treynor's index and market portfolio are presented in appendix table 15. Some of the index funds generate positive alpha values. Though, the alphas are as the active funds' very small and also insignificant from zero when 5 % was used as significance level. This result holds for a portfolio level and for each index fund separately. The values of alphas are as expected; they should lie nearby zero since the main investment strategy of passive funds is to track a specific market index. None of the passive funds have a Treynor's index that significantly differs from the excess return of the market portfolio. This result is also expected by the same reasons as the alpha values.

6.3 Persistence in performance

We complete our empirical work by performing a test for persistence in performance at semi-annual level for each fund/portfolio in 2000-2011. The test is performed by first including dummy variables in the regression where the dummy takes a value of one if the asset provides an excess return. The persistence is then studied by the amount of times that the excess return (noted as one) at *t* is followed by an excess return at *t+1*. In total we observe 28 active funds which have been divided into three sub-groups: Swedish, European and Global with respective 7, 12 and 9 funds. The index funds have been studied as a separate group including 11 funds in total.

The test of persistence in performance is started by implying the third and final performance measure of this study. The purpose is to find the amount of times, that the individual fund in the portfolio generates a higher return, than the average return of the portfolio. A winning fund is an asset that has generated an excess return at least 50 % or more of the 24 observations. The amount of winning funds within each portfolio of funds is summarized in the table 6, below:

	Active	Swedish	European	Global	Index
Winning funds	**9**	**3**	**3**	**3**	**7**
Number of funds in portfolio	**28**	**7**	**12**	**9**	**11**
Winners in %	**32,14 %**	**42,86 %**	**25,00 %**	**33,33 %**	**63,64 %**

Table 6: Winning portfolios

We can see from table 6 that each portfolio has at least three winning funds. We indicate the portfolio of funds as a winner, according to same indicators, than above used for individual funds. We notice that the percentage of winning assets, in a portfolio of active funds and for each separate sub-group, is less than 50 % and thus these portfolios do not meet the criteria of winning. We find a high variation of winning returns inside these portfolios as in the portfolio of European funds, one fund beat the average return 17 times out of 24 while another European fund beat the average return only three times. Thus only the portfolio of passive funds fulfills the requirement by having approximately 64 % of the funds considered as winners. As a conclusion we have proven that some funds have been able to beat the average return of the portfolio and can be considered as winners. However, a majority of funds do not fulfill the criteria and therefore a failure is observed in the portfolio level. The index funds represent the only winning portfolio containing 7 out of 11 that beat the average.

The last part of the empirical study is dedicated to find an answer to the question of persistence in performance. Will a well performing fund at *t* continue to generate abnormal returns at *t+1*? We estimate in matrix basis the amount of times when a fund considered as a winner, at time *t,* sustains the same performance at time *t+1* (1 followed by 1). The same method has used for loser funds (zero followed by zero) in 23 different cases. The results are summarized in the table 7, below:

	Global	European	Swedish	Active	Passive
1 followed by 1	5,56	4,08	5,71	5,12	5,73
1 followed by 0	5	4,67	5,00	4,89	5,73
0 followed by 0	7,44	9,42	7,14	8,00	5,91
0 followed by 1	5	4,83	5,14	4,99	5,64

Table 7: Performance Persistence

We can see from the table how the winning passive funds at *t* have most frequently generated higher return than average as well at *t+1*. However, the different funds have approximately the same probability of persistence in "ones" since "one followed by one" vary only from 4,08 to 5,73. We measure the persistence in underperformance by "zero followed by zero" in which the European funds have highest frequency. Interesting to notice is that none of the portfolio of funds succeeds to have 50 % or more "one follow by ones". Additionally we find that the results for the individual funds differ a lot; some funds show clear tendency to be classified as winners/losers while for others any classification cannot be made. To sum up: we can clearly observe how the European funds are worst performing group with the highest

number of “zero followed by zero” and with a lowest number of “one followed by one”. Additionally the index group is classified as the best performing group, receiving the highest number of “one followed by one” and the lowest value of “zero followed by zero”. None of the groups show on average any tendency for persistence in performance. The individual performance differs a lot between the funds where some funds show a clear tendency to persistence in performance as a winner or a loser.

6.4 Discussion: Active versus passive funds

After the implemented empirical study we are prepared to conclude our findings and answer the question: Do active funds generate excess returns? In previous parts we have utilized the factor models and estimated Jensen’s alpha, Treynor’s index and persistence in performance for each fund/portfolio. Jensen’s alpha reveals that none of the portfolios generate positive excess returns for any of the three different time periods. As a result, the alpha values for active and passive funds do not on average differ from zero and thus the assets do not generate excess returns. However according to the individual alphas, some funds explicitly beat the market, but because of their position as minority they do not have a significant impact to performance of the portfolio. Additionally, regarding the Treynor’s Index we do not find any evidence of abnormal returns. The Treynor’s differences are statistically equal to zero and thus reveal no sign of superior management. Our third and final way to find evidence of excess returns is the evaluation of persistence in performance. It is not possible to show clear over-performance regarding the active funds, only the portfolio of index funds, show a clear positive trend of performance. Furthermore by a persistence matrix we test if the winner asset at t maintains the over-performance at $t+1$. In portfolio level, we do not find any evidence of superior fund management, even though some individual funds have persistence in performance as winners or losers.

The results from the empirical study are in several aspects consistent with previous research. Jensen (1968) found that the net return of the active funds on average turned out to be negative. Malkiel (1995) found insignificant negative alphas when net returns were used exactly as replicated in this study. Gruber (1995) concluded that the active funds underperformed all benchmark models. Just by looking at our alpha values we see that the majority of the alpha values are negative, though insignificant from zero. In total it is not possible to find any evidence of superior management by using the alpha values. This is also valid for the Treynor indexes.

The sample period has been divided into three different time dependent sub-groups which are chosen to represent different market conditions. This is relevant for the study since active versus passive funds respond differently to varied market conditions. Particularly active funds are seen to have an advantage in economic downturns due to manager's option to replace the underperforming funds. In the beginning of the first sub-period (2001-2003) the IT-crash (Information Technology) had a negative influence on the world's economy. Even though this influenced Swedish economy the economy recovered quickly and the first sub-period ended in an upturn. This growth period is seen in our estimations and the statistically significant excess returns at 10 % level are obtained in the first sub-period. In 2005 the Swedish economy continued to experience an economic upturn until the world's economy faced a high volatility in the end of 2007 which diffused to the Swedish market in 2008. Due to start of the financial crisis the returns were negative and highly insignificant for the whole period. During the last sub-period 2009-2011 the market has been in turbulence due to sovereign debt crisis. This high uncertainty in the market is seen from our results since none excess returns are observed at portfolio level. However we cannot find evidence for active funds performing better than passive funds during economical downturns.

Different benchmark models reveal different alpha values. However, due to the low number of significant alphas we cannot draw any further conclusions regarding superiority of different benchmark models. Previous studies state that the three factor model is better to explain asset returns than the single index model. Therefore the alpha values from the three factor model should be more reliable than the one-factor alphas. This is to a certain extent shown in the p-values. The sub-period of 2003-2005 always reveals better alphas for three factor model compared to CAPM. The significant alpha values are in general estimated by using the three factor model as a benchmark. This may be an evidence of existing advantages of the three factor model.

Regarding persistence in performance the results are partly equal to previous research findings. Brown and Goetzmann (1995) showed that persistence in performance exists in their sample period for certain years while still it was impossible to find this phenomenon for some years. Our empirical results may, according to Brown and Goetzmann, not been explained by managements' superior knowledge. Instead, they may be explained of the strategies taken by managers. Malkiel (1995) showed that persistence in performance existed in 1970's but not in 1980's. We found that persistence in performance was impossible to find in portfolio level. Perhaps our findings are similar to Malkiel's and our measurement period is an example of a

period when persistence in performance does not exist. Thus, for individual funds it was possible to observe persistence in performance as winners or loser exactly as Malkiel (1995).

7. Conclusion

We have in this thesis evaluated the performance of 28 active and 11 passive funds listed in the Swedish fund market during the years 2000-2011. According to our empirical study it is not viable to find evidence that the active funds perform better than the index. This conclusion is based on the alpha values and Treynor's indexes. The average alpha values do not differ from zero and the average Treynor's indexes do not differ from the risk adjusted return of the market portfolio. The passive funds have on average performed better or in line with the active funds. Persistence in performance may exist for some individual funds; some funds tend to show persistence in performance as winners or losers. It is impossible to see any pattern of persistence in performance for the average portfolio of funds even though the portfolio of passive funds contained most winning funds.

From these findings we conclude that the active funds, in the Swedish fund market during 2003-2011, did not perform better than the passive funds. Thus an investor is better off when investing in cheaper index funds. The index funds performed better regarding persistence in performance and some alpha values. As a result we did not find any evidence of existence of superior management in this thesis.

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Appendix:

Aktive funds	Passive funds
SEB Aktiesparfond	Handelsbanken Sverigefond Index
SEB Europafond	SEB Etisk Global Indexfond ? Lux utd
SEB Sverigefond	SEB Europa Indexfond - Lux ack (index)
SEB Österuropafond	SEB USA Indexfond - Lux utd (index)
Länsförsäkringar Sverigefond	Aktiespararna Topp Sverige (index)
AMF Aktiefond Euroland	Evli Aktieindexfond Sverige (OMX)
Aktie-Ansvar Europa	Öhman Etisk Index Europa
Länsförsäkringar Europafond	Öhman Etisk Index Japan
Aktie-Ansvar Sverige	Öhman Etisk Index Pacific
AMF Aktiefond Världen	Öhman Etisk Index USA
DNB Utlandsfond	Swedbank Robur Mix Indexfond Sverige
Handelsbanken Amerikafond	
SEB Sverigefond Småbolag	
Alfred Berg Ryssland	
Folksams Aktiefond Europa	
Handelsbanken Tillväxtmarknad	
Nordea Tillväxtbolagsfond	
SEB Etisk Globalfond	
Skandia Aktiefond Europa	
Skandia Aktiefond Far East	
Nordea Europafond	
Nordea Europeiska Aktier	
Nordea Alfa	
SEB Sverigefond Stora bolag	
Länsförsäkringar Globalfond	
Nordea Spektra	
SEB Schweizfond	
SEB Europafond Småbolag	

Table 8: Chosen active and passive funds

	skewness	kurtosis
SEB Etisk Global Indexfond Lux utd	-0,51412019	0,665868
SEB Europa Indexfond - Lux ack (index)	-1,100165624	2,15103
SEB USA Indexfond - Lux utd (index)	-0,273174083	-0,02885
Aktiespararna Topp Sverige (index)	-0,215704408	1,219912
Evli Aktieindexfond Sverige (OMX)	-0,126397178	1,608951
Öhman Etisk Index Europa	-0,368856585	0,533573
Öhman Etisk Index Japan	0,178508689	0,197479
Öhman Etisk Index Pacific	-0,772874627	1,515755
Öhman Etisk Index USA	0,046762325	-0,16328
Swedbank Robur Mix Indexfond Sverige	-0,317074496	1,616582
SPP Aktieindexfond Global Sustainability	-8,16861587	77,72866
average	-1,057428368	7,913243

Table 9: Skewness and kurtosis for passive funds

	skewness	kurtosis
SEB Aktiesparfond	-0,343273	2,047088857
SEB Europafond	-0,8858121	2,361567203
SEB Sverigefond	-0,1831158	1,844008537
SEB Östeuropafond	-1,5303306	6,228769126
Länsförsäkringar Sverigefond	-0,0870207	1,231551647
AMF Aktiefond Euroland	-0,5186847	0,945591801
Aktie-Ansvar Europa	-0,6551775	2,294137404
Länsförsäkringar Europafond	-0,3633317	0,524093515
Aktie-Ansvar Sverige	-0,3131548	1,95236205
AMF Aktiefond Världen	-0,5853769	2,470944115
DNB Utlandsfond	-0,7393102	1,615350288
Handelsbanken Amerikafond	-0,0762229	-0,091924387
SEB Sverigefond Småbolag	0,11022834	2,785788672
Alfred Berg Ryssland	-0,4579546	0,524172101
Folksams Aktiefond Europa	-0,492931	0,679621288
Handelsbanken Tillväxtmarknad	-0,7875612	1,141066798
Nordea Tillväxtbolagsfond	-0,3693392	1,135804785
SEB Etisk Globalfond	-0,380477	0,437682841
Skandia Aktiefond Europa	-0,5991929	1,726669186
Skandia Aktiefond Far East	-0,4398666	-0,032243012
Nordea Europafond	-0,4885495	1,433842057
Nordea Europeiska Aktier	-0,738838	2,038980962
Nordea Alfa	-0,369755	2,502220838
SEB Sverigefond Stora bolag	-0,1390738	2,183615677
Länsförsäkringar Globalfond	-0,4254603	0,557248074
Nordea Spektra	-0,379239	1,768446112
SEB Schweizfond	-0,2632474	0,102121194
SEB Europafond Småbolag	-0,8577431	1,956527371
Average	-0,4771361	1,584468039

Table 10: Skewness and kurtosis for active funds

2009-2011		**Average values**	**P-values**
	Alpha CAPM	-0,20%	62,09%
	Alpha three factor	-0,57%	74,06%
	Treynor differens	-0,31%	64,80%
2006-2008			
	Alpha CAPM	-0,37%	74,39%
	Alpha three factor	-0,34%	70,74%
	Treynor differens	-0,48%	76,68%
2003-2005			
	Alpha CAPM	-0,14%	62,01%
	Alpha three factor	0,18%	37,79%
	Treynor differens	-0,12%	62,04%

Table 11: Average alpha values and p-values errors for Swedish funds

		Average values	P-values
2009-2011			
	Alpha CAPM	-0,84%	93,18%
	Alpha three factor	-1,11%	93,04%
	Treynor differens	-1,29%	96,02%
2006-2008			
	Alpha CAPM	-0,36%	79,15%
	Alpha three factor	-0,30%	70,32%
	Treynor differens	-0,45%	75,83%
2003-2005			
	Alpha CAPM	-0,03%	52,21%
	Alpha three factor	0,02%	48,68%
	Treynor differens	-0,05%	53,55%

Table 12: Average alpha values and p-values for European funds

		Average values	P-values
2009-2011			
	Alpha CAPM	-0,34%	75,51%
	Alpha three factor	-0,61%	85,22%
2006-2008	**Treynor differens**	-0,71%	80,73%
	Alpha CAPM	-0,37%	79,96%
	Alpha three factor	-0,33%	75,34%
2003-2005	**Treynor differens**	-0,62%	83,85%
	Alpha CAPM	-0,36%	76,83%
	Alpha three factor	-0,18%	62,10%
	Treynor differens	-0,39%	76,32%

Table 13: Average alpha values and p-values for Global funds

	Alpha three factor 2009-2011	Alpha three factor 2008-2006	Alpha three factor 2003-2005	Alpha CAPM 2009-2011	Alpha CAPM 2006-2008	Alpha CAPM 2003-2005	Treynor dev 2011-2009	Treynor dev 2006-2008	Treynor dev 2003-2005
SEB Aktiesparfond	-0,56 %	-0,43 %	-0,02 %	-0,25 %	-0,51 %	-0,33 %	-0,39 %	-0,72 %	-0,34 %
SEB Europafond	-1,26 %	-0,60 %	-0,04 %	-0,95 %	-0,63 %	-0,19 %	-1,36 %	-0,82 %	-0,40 %
SEB Sverigefond	-0,63 %	-0,36 %	0,13 %	-0,28 %	-0,43 %	-0,26 %	-0,42 %	-0,54 %	-0,19 %
SEB Östeuropafond	-1,95 %	-0,49 %	1,02 %	-1,71 %	-0,28 %	1,18 %	-1,71 %	-0,20 %	1,44 %
Länsförsäkringar Sverigefond	-0,43 %	-0,24 %	0,00 %	-0,11 %	-0,28 %	-0,34 %	-0,22 %	-0,38 %	-0,26 %
AMF Aktiefond Euroland	-1,76 %	0,13 %	-0,43 %	-1,41 %	0,06 %	-0,52 %	-1,89 %	0,02 %	-0,65 %
Aktie-Ansvar Europa	-1,27 %	-0,54 %	-0,26 %	-0,93 %	-0,55 %	-0,31 %	-1,20 %	-0,83 %	-0,59 %
Länsförsäkringar Europafond	-1,20 %	-0,47 %	-0,74 %	-0,96 %	-0,52 %	-0,92 %	-1,77 %	-0,79 %	-1,04 %
Aktie-Ansvar Sverige	-0,67 %	-0,25 %	0,17 %	-0,30 %	-0,26 %	-0,08 %	-0,38 %	-0,35 %	-0,10 %
AMF Aktiefond Världen	-0,62 %	-0,11 %	0,16 %	-0,37 %	-0,18 %	-0,13 %	-0,64 %	-0,32 %	-0,17 %
DNB Utlandsfond	-0,30 %	-0,40 %	-0,34 %	-0,09 %	-0,50 %	-0,54 %	-0,22 %	-0,93 %	-0,65 %
Handelsbanken Amerikafond	0,15 %	-0,43 %	-0,20 %	0,36 %	-0,47 %	-0,57 %	0,90 %	-1,05 %	-0,65 %
SEB Sverigefond Småbolag	-0,57 %	-0,74 %	0,70 %	-0,02 %	-0,69 %	0,53 %	0,02 %	-0,74 %	0,44 %
Alfred Berg Ryssland	0,59 %	-1,11 %	1,23 %	0,69 %	-0,75 %	1,6206%	0,35 %	-0,18 %	2,67 %
Folksams Aktiefond Europa	-1,36 %	-0,24 %	-0,62 %	-1,09 %	-0,26 %	-0,78 %	-1,89 %	-0,44 %	-0,97 %
Handelsbanken Tillväxtmarknad	-0,63 %	-0,23 %	0,16 %	-0,33 %	-0,10 %	0,42 %	0,74 %	0,10 %	-0,47 %
Nordea Tillväxtbolagsfond	-1,32 %	-0,53 %	-0,31 %	-0,95 %	-0,60 %	-0,68 %	2,01 %	0,87 %	0,50 %
SEB Etisk Globalfond	-0,55 %	-0,56 %	-0,18 %	-0,33 %	-0,63 %	-0,42 %	0,76 %	1,15 %	0,57 %
Skandia Aktiefond Europa	-1,04 %	-0,62 %	-0,69 %	-0,91 %	-0,50 %	-0,23 %	1,33 %	0,78 %	0,43 %
Skandia Aktiefond Far East	-0,92 %	-0,16 %	-0,47 %	-0,57 %	-0,10 %	-0,25 %	1,47 %	-0,15 %	0,21 %
Nordea Europafond	-1,46 %	-0,36 %	-0,34 %	-1,10 %	-0,37 %	-0,48 %	1,71 %	0,58 %	0,67 %
Nordea Europeiska aktier	-1,27 %	-0,09 %	-0,15 %	-0,94 %	-0,12 %	-0,23 %	1,38 %	0,21 %	0,32 %
Nordea Alfa	-0,42 %	-0,04 %	0,18 %	-0,07 %	-0,08 %	-0,21 %	0,19 %	0,20 %	0,16 %
Länsförsäkringar Globalfond	-0,50 %	-0,22 %	-0,58 %	-0,33 %	-0,33 %	-0,82 %	0,81 %	0,67 %	0,94 %

SEB Sverigefond stora bolag	-0,75 %	-0,29 %	0,12 %	-0,38 %	-0,37 %	-0,28 %	0,56 %	0,47 %	0,20 %
Nordea Spektra	-0,88 %	-0,26 %	0,01 %	-0,54 %	-0,29 %	-0,32 %	0,94 %	0,49 %	0,31 %
SEB Schweizfond	-0,53 %	-0,02 %	0,15 %	-0,21 %	-0,17 %	0,14 %	0,62 %	0,22 %	-0,01 %
SEB Europafond småbolag	-1,02 %	-0,30 %	**0,18 %**	-0,56 %	-0,24 %	0,34 %	0,94 %	0,39 %	-0,29 %

Table 14: Individual alpha values and Treynor's for active funds

	Alpha three factor 2009-2011	**Alpha three factor 2008-2006**	**Alpha three factor 2003-2005**	**Alpha CAPM 2009-2011**	**Alpha CAPM 2006-2008**	**Alpha CAPM 2003-2005**	**Treynor dev 2011-2009**	**Treynor dev 2006-2008**	**Treynor dev 2003-2005**
SEB Etisk Global Indexfond Lux utd	-0,48 %	-0,61 %	-0,32 %	-0,25 %	-0,70 %	-0,56 %	-0,54 %	-1,27 %	-0,68 %
SEB Europa Indexfond - Lux ack (index)	-0,83 %	-0,41 %	0,32 %	-0,55 %	-0,43 %	0,18 %	-0,87 %	-0,49 %	-0,02 %
SEB USA Indexfond - Lux utd (index)	0,54 %	-0,62 %	-0,43 %	0,63 %	-0,75 %	-0,79 %	1,56 %	-1,41 %	-0,94 %
Aktiespararna Topp Sverige (index)	-0,92 %	-0,40 %	-0,09 %	-0,49 %	-0,41 %	-0,40 %	-0,61 %	-0,55 %	-0,30 %
Evli Aktieindexfond Sverige (OMX)	-0,73 %	-0,45 %	-0,14 %	-0,33 %	-0,48 %	-0,47 %	-0,42 %	-0,62 %	-0,36 %
Öhman Etisk Index Europa	-1,27 %	-0,30 %	-0,23 %	-1,02 %	-0,33 %	-0,39 %	-1,67 %	-0,56 %	-0,53 %
Öhman Etisk Index Japan	-0,64 %	-0,98 %	0,21 %	-0,58 %	-0,94 %	0,31 %	7,47 %	-18,78 %	1,95 %
Öhman Etisk Index Pacific	-0,35 %	-0,13 %	0,29 %	-0,39 %	-0,07 %	0,09 %	-0,72 %	-0,01 %	0,21 %
Öhman Etisk Index USA	-0,05 %	-0,71 %	-0,40 %	0,16 %	-0,81 %	-0,79 %	0,47 %	-1,71 %	-0,86 %
Handelsbanken Sverigefond Index	-0,57 %	-0,29 %	3,27 %	-0,22 %	-0,34 %	2,49 %	-0,37 %	-0,41 %	2,66 %
Swedbank Robur Mix Indexfond Sverige	-0,33 %	-0,19 %	-0,01 %	-0,11 %	-0,21 %	-0,20 %	-0,38 %	-0,57 %	-0,30 %

Table 15: Individual alpha values and Treynor's differences for passive funds