LUNDS UNIVERSITET
Ekonomihögskolan

Focused Funds – How Do They Perform in Comparison with More Diversified Funds?

A Study on Swedish Mutual Funds

Master Thesis NEKN01

2014-06-03

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Abstract

Title: Focused Funds – How Do They Perform in Comparison with More Diversified Funds?

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Purpose: The purpose of this thesis is to determine whether or not focused funds can outperform bigger and more diversified funds, both in mean return and in its relation to risk taking.

Data and Methodology: The data used in this thesis consist of 67 Swedish mutual funds, one benchmark index and 129 stocks. All data is from the period 2007-2011. The fund data is retrieved from FactSet, the benchmark index from SIX-Telekurs and the stock data from Nasdaq OMX Nordic. In addition, the data sets contain daily data.

The information about the different funds number of holdings is retrieved from the Swedish Financial Supervisor Authority.

The performance is measured in terms of mean return and using performance measures such as Fama and French three factor model, Carhart four factor model, Jensen´s alpha et cetera. To perform this, the funds are divided and sorted into five different groups depending on their number of holdings.

Results: The overall result shows poor performance for all the Swedish mutual funds. Despite this, the conclusion is that the focused funds outperform the funds with the most holdings during the test period.

Keywords: Focused Funds, Portfolio Performance, Portfolio Management, Factor Models.

1.1 Introduction

The savings in mutual funds in Sweden has grown rapidly during the last years. During the last ten years, the fund capital has grown with 1 300 billion SEK, where about fifty percent comes from new savings. The net saving in funds were in 2012 about 74 billion SEK in comparison with the year before when it was 16 billion SEK. (Fondbolagen, 2012)

With this in mind, more and more research is done to analyze different mutual funds and especially actively managed funds with a higher fee that promises a better managed portfolio that should beat the index. Despite that a number of empirical studies, started with Jensen (1968) shows that, on average, actively managed mutual funds gives a poorer return in comparison to the risk taken and to the market index.

In a recent article, the chairman in one of the top banks in Sweden, Björn Wahlroos, claims that he do not believe that actively managed funds can outperform index funds in the long run. Despite this, the bank has more actively managed funds than ever before. He claims that the reason for this is that the demand for actively managed funds is higher than ever before and that the bank is driven by the demand. (Bursell, 2012)

The main problem behind this is then, is it really better to invest in actively managed funds or in passive index funds? To add any value at all to an active managed fund, the manager has to find undervalued securities. A popular approach for this is the Treynor-Black model, which determines the optimal asset allocation in the portfolio focusing on primarily systematic and unsystematic risk. This allows the fund manager to hold a large well-diversified portfolio and only deviate from this when he believes a security is undervalued. (Investopedia 1)

An alternative approach to this is that the fund manager instead tries to select all the goldmines which would lead to a higher return both in the short run as well as in the long run. This means that he focus only on a small set of securities leading to a less diversified portfolio but with a higher upside and downside as well.

The definition for this type of mutual fund is "focused fund". These funds generally hold less than 20-30 securities in comparison with "ordinary" mutual funds which hold, in general, more than 100 different securities. (Investopedia 2)

Furthermore, this leads to that a fund manager cannot hide behind the fact that he is following the market portfolio and in that way hide his/hers lack in portfolio management.

In an article in The Financial Review no. 43 (2008), Sapp and Yan examines fund returns based on the number of securities held and they do not find any evidence on the theory that focused funds would outperform other actively managed funds or passive managed funds. In addition, when taking into account the much higher fees of the focused funds, they significantly underperform in comparison with the other mutual funds. They conclude that their results do not support the theory that managers holding focused funds in any way has a better stock-picking skill or that this investment gives a higher return to the investor. (Sapp et al, 2008)

1.2 Problem discussion

In line with the growing savings in mutual funds, the investors are getting more and more aware of different saving types and different mutual funds. As mentioned above, the demand for actively managed funds are higher than ever before. One reason for this may be the chance of high return in the short run but also the feeling that they have a diversified portfolio since they have a professional fund manager managing it.

Further, it is much easier to just invest in a mutual fund and letting the fund manager do the research and investment for you.

Very much research these days is regarding the activity of fund managers, for example Cremers and Petajisto, 2009, analyses how actively managed funds really are using tracking error as well as active share. Cremers and Petajisto (2009) comes to the conclusion that using active share as a complement to tracking error yields a better view of how active managers really are. They conclude that the mutual funds with the highest degree of active share beat their benchmark index. The main result from their article is that their result allows us to distinguish between different mutual funds that are actively managed, i.e. you can find those that really are actively managed. (Cremers et al, 2009)

Sapp and Yan (2008) discusses that focused funds tends to have much higher return volatility as well as tracking errors. They believe that these results are correlated with a risk-taking profile where managers that are not as skilled as they should be, find quick fixes and higher returns in the short run attractive. In addition, they find no evidence on the thesis that focused funds should outperform more diversified and that fund managers that only focus on a smaller portfolio should be more skilled. (Sapp et al, 2008)

Because of the reason that the only earlier article made on this theme is the one by Sapp and Yan (2008), the main comparison will be made with their result. Further, it is very interesting to perform an analysis on a theory that has not been performed on the Swedish market before.

1.3   Purpose

The purpose of this master thesis is to examine the Swedish mutual fund market and especially so called focused funds. To do this, I will use the Fama and French three factor model as well as the Carhart four factor model. Furthermore, I will compare these results with some classical risk adjusted measures. With these results I want to examine if there exists any empirical results that suggests that you should invest in focused funds.

The main issue for this study is therefore:

- How do focused funds perform in comparison to more diversified funds?

1.4   Delimitations

I will in this thesis examine 67 Swedish mutual funds, both actively managed as well as passive and index funds. The dataset contains of daily observations from 2007 until 2011. This gives a time span of five years, which may seem short for this type of analysis, but the reasons for this are that it is generally accepted that index funds and passive funds gives a higher return for a longer time horizon. Because of this it is interesting to investigate whether or not it is possible for an active manager to perform better over a shorter period of time. In addition, since daily returns is used this yields 1260 observations. Further, many funds does not exist over a long time. If a fund performs badly the company running it will probably shut it down or merge it with some other funds and give it a new name. In

addition, there are some requirements for a fund to be classified as a so called Swedish fund and the reason why I only include Swedish mutual funds in the analysis is so it could be a fair analysis.

The requirement for a fund to be classified as a Swedish fund is that at least 90 percent of the fund capital should be invested in Swedish stocks.

2. Theory

I will in this chapter review earlier studies regarding focused funds and fund performance. Further, the subject of Survivorship Bias is discussed.

2.1   Literature review and previous studies

In 1992 Fama and French performed a study on the explanatory powers and joint roles market beta, size, earnings/price, leverage and book-to-market had on average stock returns. Their findings suggest that the beta-value of a stock, had little information about future returns, used alone or in combination with other factors. In addition, they find that size, earnings/price, leverage and book-to-market have explanatory powers about future returns. Furthermore, they find that size and book-to-market include the explanatory powers of leverage and earning/price in future returns. This leads to the conclusion that these two variables seems to be good parameters for explaining future returns. (Fama et al, 1993)

After these findings, the Fama and French three factor model has been widely used when analyzing funds and fund managers. In addition to this, the Carhart four factor model, which is the Fama and French three factor model plus one additional factor which captures the Jegadeesh and Titman´s momentum anomaly, has been a good complement for the fund researchers. (Carhart, 1997)

Further, Fama and French conclude that for portfolios holding stocks only, their three factor model is the model to use for performance evaluation.

In the article by Carhart (1997), he finds that buying the last year´s top performing funds and selling the bottom performing funds give a return on eight percent and of this difference, market value and momentum could explain for four point six percent, expense ratios and transaction cost differences explain one point seven percent. In addition, he found that fund managers with a high four factor alpha, performs above average and delivers higher expected returns in many periods. His conclusion is that his results are in line with market efficiency, the results given by Fama and French about size, book-to-market and his contribution with momentum factor. He finds that buying last year´s winners is a strategy that could be implementable to gain the momentum effect but will die out as the strategy

begins to be followed. Finally, he gives three main rules about wealth-maximizing for fund investors: "1) Avoid funds with persistently poor performance; 2) funds with high returns last year have higher-than-average expected returns next year, but not in years thereafter; and 3), the investment costs of expense ratios, transaction costs, and load fees all have a direct, negative impact on performance." (Carhart, 1997)

To return to the article by Jegadeesh and Titman (1993), the article is about a trading strategy which includes buying past winners and selling past losers. They find that this strategy realize a significantly abnormal return over their testing period, 1965 until 1989. They find that picking stocks that performed the best during the last six months and holding these for six months gives a compounded excess return of about 12 percent per year. An explanation for this they believe is because of the investors who buy past winners and sell past losers which make stock prices to jump or fall and therefore make a temporarily overreaction. (Jegadeesh et al, 1993)

In an article by Sapp and Yan (2008), they find that there are at least two explanations that seem reasonable of their result that focused funds have a tendency to underperform diversified funds. The first one is that the fund manager may be driven by the agency since there is a relation between high returns and investor cash flow which makes the fund manager more risk taking. Sapp and Yan believe that this may serve as an incentive for the managers and they especially think this holds for not so skilled managers. The second explanation, they believe, is because of the fact that focused funds are less liquid because of the smaller number of holdings. This leads to that the funds face a much greater price impact from trading. (Sapp et al, 2008)

2.2   Survivorship bias

The majority of studies define survivorship bias as a difference between two set of funds. One which is considered biased since it consist only of funds who have survived. The biased set of funds is a subset of the unbiased which consists of all the funds that investors were able to invest in at the time. (Rohleder et al, 2011)

As mentioned earlier, good historical returns is a good way to attract new investors. This leads to funds that are underperforming or poor performing after a while will be shut down.

In the article by Rohleder et al, (2011) they find positive and statistically significant survivorship bias when they are ignoring non-survivors. In addition, they find that there are often small funds that are shut down; large funds are kept alive, often to keep the flow of management fees. (Rohleder et al, 2011)

Further, companies that do not perform winnings for their shareholders or enough to keep alive will of course as well crash. This leads to that also the stock data may contain survivorship bias.

3. Methodology

This chapter contains the research approach, data and methodology used in the thesis. Further, the performance measures are described thoroughly and the reliability as well as validity is discussed.

3.1 Research Approach

In this thesis, I will apply an empirical and quantitative method to examine the performance relative to each other for the funds included in the data sample. The main purpose is to measure the fund performance in relation to each other using mean return, Fama and French three factor model and the Carhart four factor model. In addition, I will use some more classic models to test portfolio performance such as Sharpe ratio, Treynor ratio, Jensen´s alpha and Information ratio.

In the second part I will categorize the funds in level of how many securities they hold. The funds will be categorized in five different portfolios, where the ratio goes from focused to diversified and the sorting will be of the kind where the 0-20 percent funds with the least holdings will be in the first portfolio, 20-40 percent in the second and so on. This will be done both for the test using Fama and French´s three factor model, Carhart´s four factor model as well as the classical models. In addition, I will also make another categorization, where I create two portfolios, one with funds with a mean of less than twenty securities and one with mean of more than two hundred securities. This is to be able to get a better approach between the focused funds and large well diversified funds.

3.2 Data

3.2.1 Fund Data

In order to perform a portfolio evaluation, a set of data is required. The fund data is required from FactSet and is containing daily returns from 2007 until 2011.

All the funds are Swedish mutual funds which mean that at least 90 percent of the fund capital is invested in Swedish securities. Furthermore, there is no other delimitation so the fund set includes funds such as ethical funds, small cap funds, large cap funds and so on.

The different funds are sorted into five different groups after their number of holdings. The number of holdings in the funds is retrieved from the Swedish Financial Supervisor Authority.

3.2.2 Stock Data

To be able to perform the Fama and French three factor model as well as the Carhart four factor model I need stock returns to create the different factors.

The stock data contains 129 stocks traded on the Swedish market, this represent the large cap and small cap stocks traded on the NASDAQ OMXS. The data contains daily data as for the funds and the time period is from 2007 until 2011 which yields a total of 1260 returns.

The stocks closing prices are retrieved from the NASDAQ OMX Nordics web page.

The companies' different book-to-market values are retrieved from the Swedish Financial Supervisor Authority.

3.2.3 Benchmark Index

To be able to perform a fair performance evaluation it is very relevant to have a benchmark index which represents the market that is analyzed. The most widely and commonly used benchmark index for these types of analysis is the SIX Portfolio Return Index (SIXPRX).

 The SIXPRX is constructed to reflect the evaluation of the stocks on the NASDAQ OMXS with the limitation that no security can have more than ten percent of the total portfolio weight. In addition, holdings that have a weight of five percent or more in the portfolio will as a maximum have 40 percent of the total weight combined. This weight control is made on a daily basis and is because of the UCITS-directive from the European Union. (SIX Telekurs, 2014)

3.2.4 Data Return

In this thesis the returns from the different securities are used to evaluate the performance of the different funds. For both the benchmark index and the funds, dividends are included and assumed to be instantly reinvested in the portfolios.

When calculating the return, I am using the arithmetic return which is calculated by taking today's price, extracting last day´s price and dividing this with last day´s price.

$$r_{i,t} = \frac{p_{i,t} - p_{i,t-1}}{p_{i,t-1}}$$

Equation 1.

Where $r_{i,t}$ is the return for security i at time t, $p_{i,t}$ is the price for security i at time t and $p_{i,t-1}$ is the price for security i at time t-1.

3.2.5 Sample Selection

The fund data is selected in the way that only Swedish mutual funds are included. This is to be able to perform a fair evaluation. Since I need the number of holdings for each fund, funds that have not reported in their number of holdings are sorted out. This yields a total of 67 Swedish mutual funds.

The stock data is collected to be able to reflect the different anomalies on the market. Because of this and the time constraint, middle cap stocks are not included in the analysis. Furthermore, stocks that do not have any data for the whole time period is of course sorted out.

Since the data only includes funds and stocks that are alive during the period of analysis, the analysis might be affected by survivorship bias.

All the data contains of daily data and it is the daily return that is used for all the calculations and regressions in the thesis.

3.3   Portfolio Performance

In this section, the different portfolio performance measures are described as well as the formulas and theory behind.

3.3.1 Fama and French Three Factor model

The first measure to be used to evaluate whether or not focused funds outperform more diversified funds are the Fama and French three factor model.

The Fama and French three factor model is considered as an alternative approach to portfolio evaluation using firm characteristic instead of specifying macroeconomic factors as the reasons for systematic risk. (Bodie et al, p. 363)

The systematic factors are instead firm size, book-to-market and the market index. The reasoning behind these is because of the empirical findings of Fama and French (1993) and shows that the historical returns, for smaller firms and high book-to-market value, are higher than the one stipulated by the security market line from CAPM. Furthermore, this suggests that these factors could be sources for exposure to systematic risk that is not captured by the CAPM beta value, and hence results in a higher return. (Bodie et al, p. 447)

Fama and French (1996) argue for that so called anomalies of CAPM, are captured in their three factor model. In addition, they find evidence for that their model also captures the reversal of long-term returns. (Fama et al, 1996)

The regression framework is the following:

$$r_{i,t} - r_f = \alpha_i + \beta_{1,i}(r_{m,t} - r_f) + \beta_{2,i}SMB_t + \beta_{3,i}HML_t + \varepsilon_{i,t}$$

Equation 2.

In this time-series regression $r_{i,t}$ is the return on fund i for time t, r_f is the risk free rate (6 month STIBOR with daily observations), α_i is the rest of the excess return which is not explained by the model, $r_{m,t}$ is the return of the market index for time t, SMB_t is the small minus big portfolio return for time t, HML_t is the high minus low portfolio return for time t and $\varepsilon_{i,t}$ is the regression residual. (Fama et al, 2010)

The portfolios are constructed in the following way:

The SMB portfolio consists of the smallest stocks (calculated by taking the stock price and multiplying it with the number of shares) minus the biggest stocks. Because of the fact that I

have an odd number of stocks, 129, the median stock is not included in the portfolio. In addition, the portfolio is reweighted for every year. This yields a zero-investment factor mimicking portfolio containing 128 stocks.

The HML portfolio is constructed of the top 30 percent of book-to-market minus the bottom 30 percent. This yields that we have 78 stocks in this portfolio. Furthermore, this portfolio is constructed for the start of the test period and remained the same. The HML portfolio is as well a zero-investment factor mimicking portfolio.

Fama and French interpret the SMB and HML portfolios as diversified passive benchmarks which are used to capture patterns in the returns during the test period. By abstracting these factors as well as the excess return on the market index leaves us with the alpha which is the return that is explained through active management or stock picking. Furthermore, a positive alpha signals good performance while a negative alpha is the opposite. (Fama et al, 2010)

3.3.2 Carhart Four Factor Model

The second measure to evaluate the fund performance is an extension of the Fama and French three factor model.

In the conclusion of Fama and French´s article (1996), they conclude that their model does not explain the continuation of short-term returns, which was empirically found by Jegadeesh and Titman (1993). (Fama et al, 1996)

Luckily for Carhart, he published his article in 1997, using Fama and French´s (1993) three factor model and adding another factor, Momentum, capturing the anomaly stipulated by Jegadesesh and Titman (1993). (Carhart, 1997)

Carhart found that, what appeared to be the alpha in the three factor regression model could be explained by their market momentum. (Bodie et al, p. 453)

The regression framework is as follows:

$$r_{i,t} - r_f = \alpha_i + \beta_{1,i}(r_{m,t} - r_f) + \beta_{2,i}SMB_t + \beta_{3,i}HML_t + \beta_{4,t}MOM_t + \varepsilon_{i,t}$$

Equation 3.

Where $r_{i,t}$ is the return of fund i for time t, r_f is the risk free rate (6 month STIBOR with daily observations), α_i is the rest of the excess return which is not explained by the model, $r_{m,t}$ is the return of the market index for time t, SMB_t is the small minus big portfolio return for time t, HML_t is the high minus low portfolio return for time t, MOM_t is the momentum portfolio for time t and $\varepsilon_{i,t}$ is the regression residual. (Carhart, 1997)

The SMB and HML portfolios are constructed as for the Fama and French three factor model.

The MOM portfolio is constructed using the top 30 percent with the highest return minus the bottom 30 percent in the same category. This yields a portfolio consisting of 78 stocks. This portfolio is as well as the SMB portfolio reweighted every year. The MOM portfolio is a zero-investment factor mimicking portfolio as well as the SMB and HML portfolios.

As mentioned earlier, the extra factor is to capture the momentum anomaly discovered by Jegadeesh and Titman (1993).

3.3.3 Sharpe Ratio

The Sharpe Ratio, first proposed by William Sharpe, is a reward-to-volatility measure. It measures the ratio between the excess return of the asset and the standard deviation of the asset. It is computed as follows:

$$SR_i = \frac{\overline{r_i} - \overline{r_f}}{\sigma_i}$$

Equation 4.

Where SR_i is the Sharpe Ratio for fund i, r_i is the mean return of fund i, r_f is the risk free rate and σ_i is the standard deviation of the return for fund i. (SU, 1994)

3.3.4 Treynor´s Measure

The Treynor measure is, as well as the Sharpe ratio, a reward-to-volatility measure. It measures the ratio between the excess return of the asset over the assets beta-value. This yields that instead of total risk it uses the assets systematic risk. (Treynor, 1966) The Treynor measure is calculated as follows:

$$T_i = \frac{\overline{r_i} - \overline{r_f}}{\beta_i}$$

Equation 5.

Here, T_i is the Treynor measure for fund i, r_i is the mean return of fund i, r_f is the risk free rate and β_i is the beta-value for fund i. (Bodie, Kane, Marcus p.850)

3.3.5 Jensen´s Alpha

The Jensen measure or Jensen´s alpha is the average return for a given fund or portfolio excess over the average return predicted by CAPM in relation to the fund´s beta-value and average return of the market. The Jensen measure is calculated as follows:

$$\alpha_i = \overline{r_i} - [\overline{r_f} + \beta_i(\overline{r_m} - \overline{r_f})]$$

Equation 6.

Where α_i is the Jensen´s alpha, $\overline{r_i}$ is the average return for fund i, $\overline{r_f}$ is the risk free rate, $\overline{r_m}$ is the average market return and β_i is the beta value for fund i. (Jensen, 1968)

3.3.6 Information Ratio

The information ratio divides the Jensen´s alpha of the fund or portfolio with the nonsystematic risk, standard error, of the fund or portfolio. This is a measure of abnormal return per unit of risk. The information ratio is calculated as follows:

$$IR_i = \frac{\alpha_i}{\sigma(e_i)}$$

Equation 7.

Where IR_i is the information ratio for fund i, α_i is the Jensen´s alpha and $\sigma(e_i)$ is the standard error of fund i. (Bodie et al, p. 850)

3.4   Statistical approach

When analyzing the different funds in order to find evidence that focused funds outperform more diversified funds a statistical approach is used to calculate the Fama and French three factor model as well as the Carhart four factor model. The regressions are performed for the

whole test period and are made in the statistical software program EViews. The regression models applied can be found in section 3.3.1 and 3.3.2.

3.5   Methodological discussion

In this section I will discuss the reliability and validity of the thesis. This is basically how consistent my results are over time, if the results are the same for repeated tests independently of who the study is made of and if the thesis analyzes what it is intended to analyze.

3.5.1 Reliability

In this thesis, the reliability is of two different matters. First we have the methods used in the thesis and secondly we have the data used. The data is collected from reliable sources and should not cause any doubts.

Furthermore, since all the funds are Swedish mutual funds, the terms of this are described earlier, it may cause a difficulty in the sense that many of the funds hold the same assets and may therefore show similar results in the analysis. This issue is mainly among the passively managed funds and should therefore not give me any problem with my purpose of this thesis.

In addition, all the mutual funds in the analysis have been active through the whole time period and as mentioned earlier may this cause survivorship bias. This could yield that the data set shows a result that is too good.

3.5.2 Validity

The methods used in this thesis are well accepted and widely used. Both Fama and French´s three factor model and Carhart´s four factor model has been challenged but there are not any newer or better approaches yet.

Furthermore, it is of some importance to have external validity. In the article by Sapp and Yan (2008) they examine the fund market in the U.S. Since there exists big differences between both the size of their dataset and the differences between the American market and the Swedish market the results of their analysis may differ.

4. Empirical Findings

I will in this section present the results regarding the Swedish mutual fund performance. I will start by presenting the results for the Fama and French three factor model, then the Carhart four factor model and finally the more classical approaches. In the end I will compare the difference results between the measures.

In addition to this I will also present a comparison between the most focused funds and the limit for these are arbitrarily chosen by me and set to a maximum of twenty holdings with the most diversified funds and the limit for these are at least 200 holdings. Further, two sub periods are created and presented.

4.1 Fama and French Three Factor Model

To examine the fund performance I sort all the different funds into five different groups based on the mean number of holdings during the test period. This implies that I have fourteen different funds in group 1 and 5 and thirteen in groups 2-4. I estimate the alpha based on the factor models described above.

	Number of holdings (Mean value)	Mean Return	Alpha	$\beta(r_m - r_f)$	β(HML)	β(SMB)
1-Focused	24.2143	0.0117	-0.0394	0.0742	0.0051	0.0059
(t-statistic)			(-0.9754)	(3.1312)	(11.6035)	(14.566)
2	30.6923	0.0114	-0.0434	0.0815	0.0058	0.0066
(t-statistic)			(-1.0102)	(3.196)	(12.1714)	(15.2354)
3	39.0769	0.0100	-0.0404	0.0706	0.0049	0.0057
(t-statistic)			(-0.9794)	(2.9356)	(10.6984)	(13.5905)
4	57.3077	0.0117	-0.0403	0.0715	0.0052	0.006
(t-statistic)			(-0.9877)	(3.0671)	(11.6983)	(14.7379)
5-Diversified	106.1429	0.0091	-0.0431	0.0770	0.0053	0.006
(t-statistic)			(-1.0628)	(3.2299)	(11.8077)	(14.8788)

Table 1. Fama and French three factor model. T-values are in parenthesis.

As can be seen in table 1, the mean return is highest for group 4 closely followed by group 1, but overall the mean return is quite similar.

For the three factor alpha, it can be noticed that they are all negative which indicate poor portfolio performance by the managers. Regarding the groups, it can be noticed that the most focused group has the value closest to zero.

By just comparing the group with the most focused funds with the group with diversified funds it can be noted that the focused funds yields a vaguely better three factor alpha.

Furthermore, we can observe that the market factor has the highest impact on all the groups of the different factors in the regression.

4.2   Carhart Four Factor Model

Based on the Carhart four factor model and the same groups as described in the section above I get the following results.

	Number of holdings (Mean value)	Mean Return	4 factor Alpha
1-Focused	24.2143	0.0117	0.1068
(t-statistic)			(-3.0903)
2	30.6923	0.0114	0.11715
(t-statistic)			(-3.1720)
3	39.0769	0.01	0.1026
(t-statistic)			(-2.793617692)
4	57.3077	0.0117	0.1078
(t-statistic)			(-3.1130)
5-Diversified	106.1429	0.0091	0.1082
(t-statistic)			(-3.1386)

Table 2. Carhart four factor model. T-values are in parenthesis.

	β(r_m-r_f)	β(HML)	β(SMB)	β(MOM)
1-Focused	0.0259	0.0016	0.0088	-0.0067
(t-statistic)	(1.3158)	(3.9876)	(24.3073)	(-22.6611)
2	0.0285	0.0019	0.0098	-0.0073
(t-statistic)	(1.3347)	(4.451)	(25.4387)	(-23.3611)
3	0.0233	0.0014	0.0085	-0.0065
(t-statistic)	(1.2228)	(3.4384)	(22.3772)	(-21.0015)
4	0.0227	0.0016	0.0089	-0.0067
(t-statistic)	(1.2089)	(4.0046)	(24.5619)	(-22.8617)
5-Diversified	0.0271	0.0016	0.0091	-0.007
(t-statistic)	(1.3635)	(3.9951)	(25.126)	(-23.5375)

Table 3. Carhart four factor model regression coefficients. T-values are in parenthesis.

As can be noticed in table 2, all the four factor alphas are positive which indicates a better portfolio performance than the three factor alpha did. The reason for this can be found in table 3, where the momentum coefficient is significantly negative for all the groups of funds.

By just comparing the focused group with the diversified we can see that the diversified funds have a slightly more positive four factor alpha than the focused funds.

Furthermore, we can observe that the portfolios are relatively even in terms of the alpha value. The only one that differs a little with a higher alpha value than the rest is group number 2.

In addition, the market factor has still the highest impact on all the groups in the regression while the book-to-market factor (HML) has a lower impact now than in the three factor model. The size factor (SMB) has a little higher impact now than in the three factor model.

4.3   Risk Adjusted Portfolio Performance Measures

	Number of holdings (Mean value)	Sharpe Ratio	Treynor Measure	Jensen´s Alpha	Information Ratio
1-Focused	24.2143	-0.0055	-0.0881	-0.0063	-0.004
2	30.6923	-0.0055	-0.0819	-0.0063	-0.004
3	39.0769	-0.0068	-0.0812	-0.008	-0.0054
4	57.3077	-0.0055	-0.083	-0.0063	-0.004
5-Diversified	106.1429	-0.0073	-0.1016	-0.0088	-0.0057

Table 4. Risk adjusted portfolio performance measures.

Table 4 shows the Sharpe ratio, Treynor´s measure, Jensen´s alpha as well as the information ratio for the five different groups of fund holdings. The calculation for the different measure is described thoroughly in section 3.

Regarding the results it is quite surprisingly the group of funds with the most number of holdings that yields the lowest result in all of the four measurements. Another interesting thing is that group 4 has the highest Sharpe ratio and is top three for the other three measures.

If we are just comparing the group with lowest number of holdings with the group with the highest number of holdings, we can notice that the focused funds clearly outperform the more diversified.

4.4   Focused versus Diversified Funds

In this section I will present a comparison between the funds that holds fewer than twenty assets and the funds that holds more than two hundred assets.

Further, I have divided the time period into two different subsamples'; one between 2007 and 2009 and the other from 2009 to 2011. This is an attempt to clarify the results even more.

Number of holdings	Mean Return	3 factor alpha	4 factor alpha	Sharpe Ratio	Treynor Measure	Jensen`s Alpha	IR
Under 20	0.0123	-0.0334	0.0907	-0.0054	-0.0893	-0.0061	-0.004
(t-statistic)		(-0.8914)	(2.7948)				
Over 200	0.0088	-0.0428	0.1044	-0.0071	-0.1061	-0.0091	-0.0057
(t-statistic)		(-1.023)	(2.8786)				

Table 5. Portfolio performance. T-values are in parenthesis.

Number of holdings	$\beta(r_m-r_f)$	$\beta(HML)$	$\beta(SMB)$
Under 20	0.0603	0.0042	0.0048
(t-statistic)	(2.8635605)	(10.44865)	(13.1323)
Over 200	0.075	0.0051	0.0059
(t-statistic)	(3.6146)	(10.8788)	(13.7863)

Table 6. Fama and French three factor model regression coefficients. T-values are in parenthesis.

Number of holdings	$\beta(r_m-r_f)$	$\beta(HML)$	$\beta(SMB)$	$\beta(MOM)$
Under 20	0.0193	0.0012	0.0073	-0.0057
(t-statistic)	(1.1123)	(3.2435)	(21.4685)	(-20.4025)
Over 200	0.0176	0.002	0.00965	-0.007
(t-statistic)	(1.2556)	(3.594)	(23.2459)	(-21.7356)

Table 7. Carhart four factor model regression coefficients. T-value are in parenthesis.

By just comparison the funds that holds fewer than twenty assets with the funds that hold more than two hundred we observe in table 5 that the focused funds outperform the diversified according to five out of six measures and in mean return as well.

In table 6 it is notable that the diversified funds take more impact from the size (SMB) factor than the book-to-market (HML) factor while the focused funds are more exposed to book-to-market factor than the size factor.

In addition, in table 6 we observe that the momentum factor has a more negative impact on the diversified funds than on the focused funds. Furthermore, notice that both of the groups have most exposure to the market factor.

Number of holdings	Mean return	3 factor alpha	4 factor alpha	Sharpe Ratio	Treynor Measure	Jensen's Alpha	IR
Under 20	-0.0083	0.0243	0.08193	-0.0193	1.207	-0.0298	-0.0196
(t-statistic)		(0.5597)	(1.9987)				
Over 200	-0.0206	0.0223	0.0829	-0.0233	0.9994	-0.0423	-0.0236
(t-statistic)		(0.4970)	(1.9055)				

Table 8. Portfolio Performance 2007-2009. T-values are in parenthesis.

Number of holdings:	$\beta(r_m-r_f)$	β(HML)	β(SMB)
Under 20	-0.0197	-0.018597	0.002516
(t-statistic)	(-0.8146)	(-15.6574)	(7.0751)
Over 200	-0.0182	-0.0238	0.003
(t-statistic)	(-0.7525)	(-19.0185)	(7.9610)

Table 9. Fama and French three factor model regression coefficients. T-values are in parenthesis.

Number of holdings:	$\beta(r_m-r_f)$	β(HML)	β(SMB)	β(MOM)
Under 20	-0.0152	-0.0145	0.0044	-0.003
(t-statistic)	(-0.6419)	(-11.6942)	(10.7872)	(-8.4178)
Over 200	-0.0134	-0.0195	0.005	-0.0031
(t-statistic)	(-0.5786)	(-14.9534)	(11.4653)	(-8.2552)

Table 10. Carhart four factor model regression coefficient. T-values are in parenthesis.

In table 8, the empirical results from the first sub period is presented. It can be obtained that the mean return for this period is lower, for both of the fund categories, than in the whole time period. Further, the three factor alpha is now positive; this means that despite the negative mean return, the fund managers seems to have done a good job during this time period. The four factor alpha does not differentiate so much from the results for the whole time span and the only thing that does differentiate is the Treynor measure, which now is positive. This is because of the fact that the funds have a negative beta value, which implies that if the benchmark index drops in price, the fund share rises.

In addition, it is noticeable that the only factor that does not have a negative impact on the funds is the market factor. All the other factors, in both the three and four factor model, show a negative influence on the returns.

Number of holdings:	Mean return	3 factor alpha	4 factor alpha	Sharpe Ratio	Treynor Measure	Jensen's Alpha	IR
Under 20	0.0451	-0.001	0.0231	0.0203	0.0093	-0.1878	-0.1771
(t-statistic)		(0.014)	(0.6173)				
Over 200	0.0543	-0.0042	0.0137	0.0229	0.0203	-0.0478	-0.0335
(t-statistic)		(-0.089)	(0.2894)				

Table 11. Portfolio Performance 2009-2011. T-values are in parenthesis.

Number of holdings:	$\beta(r_m-r_f)$	$\beta(HML)$	$\beta(SMB)$
Under 20	0.1501	0.0084	0.0088
(t-statistic)	(5.687)	(11.4261)	(12.1199)
Over 200	0.1747	0.0108	0.0113
(t-statistic)	(5.6723)	(12.7185)	(13.5432)

Table 12. Fama and French three factor model regression coefficients. T-values are in parenthesis.

Number of holdings:	$\beta(r_m-r_f)$	$\beta(HML)$	$\beta(SMB)$	$\beta(MOM)$
Under 20	0.1224	0.0077	0.0095	-0.0014
(t-statistic)	(4.283)	(9.7545)	(12.2646)	(-2.5797)
Over 200	0.1542	0.0102	0.0117	-0.0011
(t-statistic)	(4.6271)	(11.2841)	(13.2043)	(-1.6082)

Table 13. Carhart four factor model regression coefficients. T-values are in parenthesis.

Table 11 shows the result of the performance measures during the period 2009-2011. For this period, the mean return is positive again and it is noticeable that both the three and four factor alphas have dropped. Further, there is now a positive Sharpe Ratio, a drop in the Treynor measure, a slightly more positive Jensen´s alpha and a slightly lower Information Ratio. The interpretation of this is that the factor alphas drop is because of the fact that the funds have performed poorer especially in comparison to the benchmark index.

4.5   Empirical Findings – Conclusion

In this section I will show a comparison of all the performance measures for all the groups of funds in the analysis.
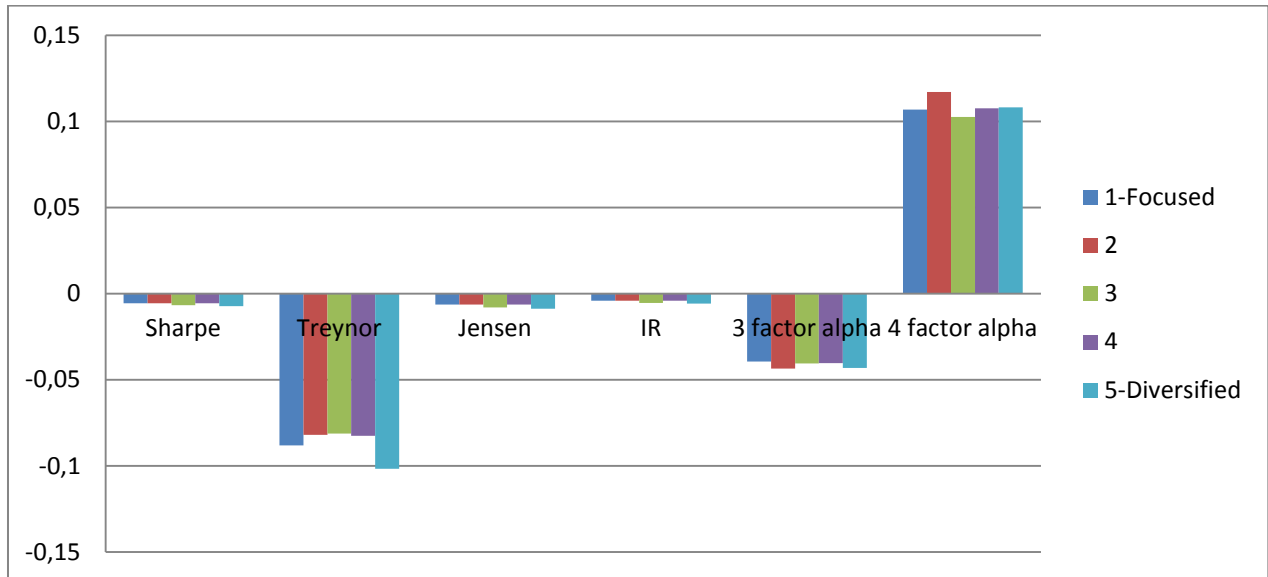

Figure 1. Comparison of all the performance measures for the different fund groups.

In section 4.1-4.4 I have showed the empirical result I have found in my analysis which is used to answer the question of this thesis. I have showed that all the groups of funds have a negative three factor alpha which indicates poor performance but at the same time does all show a positive four factor alpha. Furthermore, both of the regressions indicates that the market factor has the most impact on the funds excess returns while the size and book-to-market factors has a positive impact but not as large as the market factor. In addition, the four factor regression shows that the momentum factor has a negative impact on the funds excess return.

As can be observed in figure 1, the differences between the different groups of funds are relatively small. The reasons for this as well as all the result will be discussed and analyzed in the next section.

5. Analysis

In the analysis section I will analyze and come with interpretations regarding the empirical results showed in the previous section. I will start by shortly comment the economic situation as a whole in Sweden during the test period and I will then compare my results with previous studies as well as with economical theory.

5.1   Performance

Sweden has as a nation a strong economic position in relation to a lot of other countries. Despite this, it is only the international sector that delivers a strong growth rate. Overall, the Swedish economy has performed quite well with an annual growth rate of two point five percent between 1993 and 2010. (MGI, 2012)

When reading this thesis, one should have in mind the different market situations during the test period. During the first years of the test period an extensive financial crisis raged throughout the world. The crisis did not affect Sweden in the same way as many other countries but despite this, the Swedish large cap index, OMXS 30, dropped with 57.8 percent between July 2007 and October 2008. This is also the main reason for the extra tests and the sub sample periods.

Furthermore, the mean return of all the funds in my dataset was during the time period of the thesis 0.011 percent. That is, almost zero. The mean return of the large cap stocks was during the same period -0.112 percent and for the small cap stocks I have a mean return of 0.133 percent. It is easy to conclude that this was not a particularly good time period for the Swedish financial market.

 Despite this, a fund performance evaluation can be made since the comparison is between the different funds and how they perform in relation to each other when they have the same prerequisites.

Since this is the first analysis of its kind, on the market of Swedish mutual funds, the main comparison will be with the article of Sapp and Yan (2008).

Starting by just comparing the mean returns for the five different groups of funds, I obtain that group 1, with the most focused funds, group 4 and group 2 has the highest mean return

during the time period. The only group that does not have above 0.01 percent in mean return is group 5, the funds with the highest number of holdings. This clearly contradicts the result by Sapp and Yan (2008) where the returns for the quintile with the highest number of holdings outperform the one with the least number of holdings by 0.1 percent per month. The reason for why the focused funds outperform the ones with a higher number of holdings I believe is because of the poor performance by the large cap stocks. Even if they have a great number of holdings they may have a greater holding in the large cap stocks than in the small cap stocks which generates a positive return during the test period. In addition, if the fund managers for the focused funds have some stock picking skills, they should have invested more in the small cap stocks which would have generated in a greater return.

Continuing to the Fama and French three factor model I find that the group with focused funds is ranked first while the group with the funds with the most holdings is ranked last. Furthermore, group 1 is the only that are above -0.04 but the difference between the funds are not so big. Like with the mean return, my empirical findings contradict with the one of Sapp and Yan (2008). Positively, the results do not differ as much for the 3-factor alphas but the rankings do contradict each other. For Sapp and Yan (2008) the quintile with the focused funds has the most negative alpha while the one with the most holdings are ranked second. In addition, Sapp and Yan (2008) do not share their three factor model regression coefficients. I find that the factor that has the most impact on the funds according to the three factor model is the market factor. The reason for this I believe is due to the poor performance of the funds in general.

For the Carhart four factor model, I find that all the alphas are in a close range and that the only one that differs a little in a positive way is fund group 2. The interesting here is that we now have a positive alpha, which contradicts with the result from the Fama and French three factor model. This result is in line with the one for the focused funds of Sapp and Yan (2008) which also gets a better alpha in the four factor model than in the three factor model. Furthermore, I can notice that the momentum factor has a negative effect on all the fund groups. By examining the results in the article by Carhart (1997) we can see that for his fund data were he sorts the portfolios based on the past one-year return, he finds that the portfolios delivering the highest return last year is outperforming the others. In addition, he finds that the top performing funds are positively correlated with the momentum

factor. (Carhart, 1997) That is of course in line with the anomaly factor described earlier. If we reconnect this with my results I can start by commenting the negative momentum factor I have. I believe it is because of the poor performance overall by the funds. Further, the thesis is not about finding any momentum anomaly and therefore is the portfolios not sorted and weighted for this purpose. The reason of why all the portfolios show similar dependence in the factors is because of the similarity of the funds and the classification rules for Swedish mutual funds.

Continuing to the risk adjusted measures, I find that the group with focused funds clearly outperform group 5, the one with the highest number of holdings. Overall, the best performing groups of funds according to these measures are group 1, 2 and 4 while group 5 shows the poorest performance by all the risk adjusted measures.

By returning to figure 1, we can notice that all the different measures for portfolio performance indicates, overall, poor performance except the Carhart four factor model. The Carhart four factor model explains this by taking a negative impact of the momentum anomaly, a less impact of the high minus low factor as well as for the market factor and a greater impact of the size factor. Of these four factor mimicking portfolios, it is only the momentum and size portfolios that have a positive mean return during the test period.

5.2   Analysis – Focused versus Diversified Funds

The main issue for this study is to analyze how focused funds perform compared to more diversified funds. If we look at the results presented in section 4.4 it is easy to obtain that the most focused funds outperform the funds with the most number of holdings in the data set. It is only according to the Carhart four factor model that the funds with the most holdings perform better than the focused funds. Continuing to the data analyzed in section 5.1, group 1 outperform group 5 according to all the measures aside from the Carhart four factor model. These findings clearly contradicts with the ones of Sapp and Yan (2008) which finds that the focused funds significantly underperform compared to the funds with the most number of holdings. (Sapp et al, 2008) The reason for this I believe is because of the sample period. Sapp and Yan (2008) have a sample period from 1984 to 2002. It is generally accepted and many times proven that index funds and diversified portfolios beats actively managed portfolios over a longer investment horizon. Another reason of why the results

differ can of course be because of the difference between the American and Swedish market.

In addition, when dividing the test period into two sub sample periods, I find that the focused funds outperform the more diversified funds. Even if the mean return is slightly lower under the second sub sample, I find both a better three as well as four factor alpha. For the first sub period, the mean return is higher for the focused funds and I find a more positive result in the majority of the tests taken into account.

6. Conclusion and Discussion

I will in this section discuss the empirical results and the analysis of the study. In addition, some conclusions will be drawn from the study.

The aim of this thesis was to detect if some fund managers are able to add extra value to their funds by adding more undervalued securities. If this were the case, I would expect them to focus their funds to better capitalize on their stock picking skills and skills as a fund manager. By investing more in the undervalued securities and sell of other securities, giving the fund a lower number of holdings and therefore a more focused fund would yield a greater return. I investigate in this thesis whether or not funds with a lower number of holdings, so called focused funds, are able to perform better than more diversified funds. It is generally accepted that index funds and passive funds generate a higher return over a long time horizon. Because of this, it is interesting to investigate if this is the case also for a shorter time.

When examining the funds, five groups of funds were made. The groups were constructed with the funds with least number of holdings in group one and then sorted up to group five which holds the funds with the most number of holdings. The groups of funds were examined using the Fama and French three factor model, the Carhart four factor model and some classical risk adjusted measures.

My results show that the focused funds, the funds with the lowest number of holdings, perform better than the funds with the most number of holdings. By just comparing the most focused funds with the funds with the most number of holdings, we can easily see that the focused funds have performed better during the test period. This conclusion contradicts with the one of Sapp and Yan (2008). The reasons for this I have mentioned earlier but the main reason I believe is that it is possible for skilled fund managers to find undervalued securities and in the short run beat index funds and passively managed funds.

When dividing the test period into two sub periods, I find that the focused funds outperform the diversified funds during the poorer period of the two. This contradicts my beliefs from before this analysis started when my thoughts were that the focused funds should be able to outperform the diversified during better time periods. Further, I find that the focused funds

have a slightly poorer mean return during the second sub sample but, despite this, perform better accordingly to my different portfolio performance tests.

One should have in mind that the test period over all delivered a poor return and this may be one of the reasons why larger funds underperform relative to the others. On the other hand, more diversified funds should be able to perform better even if the market performs poorly due to the less risk taken in the bigger funds than for the focused funds.

The conclusion I take from this is that diversified index funds or diversified passively managed portfolios should be favorable in the long run but focused funds can be a good spice in the more risk taking investors portfolio. The problem is that it may be difficult to find a fund with a skilled manager only by looking at the funds number of holdings. In addition, investors may have a timing problem, buying when the security is expensive and selling when it has dropped in price. The general recommendation is still that for the long run investor, diversified portfolios should be the first pick but if you are willing to take some risk for a higher short run return, focused funds have the potential to bring it to you.

7. Future Research

When writing and performing this thesis, a few ideas regarding future research has come to mind. First, it would be interesting to do some test regarding how active the fund managers are, for example this could be done by calculating the Active Share as in the article by Cremers and Petajistos (2009).

Secondly, it would be interesting both with a longer time horizon as well as with a shorter one. Though, it is very time consuming to manually form the factor portfolios and to perform the regressions in EViews, so one may not choose too many different time periods if working with a short deadline.

Thirdly, it would be interesting in a future work to estimate fund performance using a conditional model like the one in the article by Ferson and Schadt (1996).

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