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Master's Degree Project in Finance

Does managerial skill exist?

- A study of value added and its impact on mutual fund performance

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## Abstract

This thesis investigates and compares the relationship between managerial skill and its impact on open-end mutual fund performance in terms of net alpha. The approach is to study managerial skill measured in terms of value added. Using descriptive statistics with one-tailed t-test of value added over the period between January 2008 and December 2017, the results obtained suggest persistency in value added and thus that there is strong evidence that managerial skill exists.

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## 1. Introduction

Investments in mutual funds has developed drastically, resulting in mutual fund fees becoming a topic of interest. According to Swedish Investment Fund Association, 8 of 10 Swedish residents have savings in mutual funds. However, the knowledge of mutual funds is poor, which is why most invest in actively managed funds in order to get the desired exposure in the market without having the comprehension.

The main purpose of this thesis is to explore whether managerial skill exists, and to which extend it has an impact on mutual fund performance. There are numerous papers that have studied whether equity mutual funds are able to consistently earn positive risk-adjusted returns. However, many of both early and new research tend to incline to the findings that there is no mutual fund managerial skill.

Previous literature has focused on net alpha as a measure of skill of portfolio managers. However, net alpha only measures abnormal return and thus is not the optimal measure of skill since it does not measure value (Berk and Binsbergen (2013)). In terms of managerial skill, i.e. value added, not only the portfolio manager as an individual is considered, but also marketing, exposure of the mutual fund and other activities resulting in the outcome of all expertise used to withdraw money from financial markets.

By studying open end mutual funds between the years 1945 – 1964, Jensen (1968) found lack of evidence that a mutual fund could outperform a random chance. Flam and Vestman (2017) recently studied the Swedish equity mutual fund market between the years 1993 – 2013 with the result that there is no evidence of stock-picking skills and that investors should choose passively managed funds with low fees.

Sharpe (2013) stated that "A person saving for retirement who chooses low-cost investments could have a standard of living throughout retirement more than 20% higher than that of a comparable investor in high-cost investments". This statement is in contradiction of the overall interest in mutual funds, which further on is an indication that investors are not being aware of what they pay for when investing in mutual funds.

Charles Ellis (2012) stated that fees seem low as a percentage of assets but as a percentage of returns fees no longer seem low. Investors should consider fees charged by active managers not as a percentage of total returns but as incremental fees versus risk adjusted incremental returns above the market index.

All these statements suggest an incline towards passively managed mutual funds. Studies have been conducted regarding the comparison of actively and passively managed mutual funds. Kaissar and Ritholtz (2017) discussed this topic. The big investment shift of recent years is from actively managed mutual funds to passive mutual funds, where households have been buying index funds and neglecting fund managers that aim to outperform the benchmark at a higher cost. Indeed, many clients would surely be happy to pay more if it directly translated into higher returns, but it is difficult to be sure that a fund manager have the required skills. On the other hand, fund managers can not statistically be expected to outperform the market every year. Households, however, expect that in the long run. It should not be a surprise that the average fund fails to beat the benchmark. The "iron law of costs" is that, in aggregate, professional fund managers own most of the stock market. Thus, their performance is highly likely to resemble that of a benchmark that tracks the overall market. However, the benchmark does not incur costs or fees; fund managers do. Thus, the average fund manager must underperform the market, after costs.

Buttonwood (2017) stated that active fund management may have a more important role to play in other places: emerging markets, for example, where information about the prospects of individual companies is not so widely available; or bond funds, where S&P did find some evidence of persistent performance in areas such as mortgage-backed securities, municipal debt and investment-grade debt. In such areas, specialist knowledge may prove an advantage. However, when it comes to American equities, the average fund manager runs a portfolio for only around four-and-a-half years. As a result, if you pick a fund based on its record, the chances are that a new person is in charge. Hence, the old saying that "past performance is no guide to the future" should be the truth.

The main question this thesis attempts to answer is whether the compensation that the portfolio manager receives is justified. This is done by examining if there exists any managerial skill. If the results show no skill this might be an indication that investors are better of investing in low-cost index mutual funds.

## 2. Literature review

Most of previous studies have concluded that fees have a negative impact on mutual fund performance in terms of risk-adjusted returns. Sharpe (1966) concluded this early when studying differences in risk-adjusted returns across funds. The result was that fund fees is the main attribute of the difference in returns.

Jensen (1968) studied open end mutual funds between the years 1945-1964 in order to exploit fund management "outperformance" regarding risky investments. By assuming that the "performance" has two different dimensions, the ability of the portfolio manager or security analyst to increase returns on the portfolio through fortunate prediction of future security prices as well as the ability of the portfolio manager to minimize the "insurable risk" raised from the holders of the portfolio through "efficient" diversification, the conclusion was that on average the funds were not quite successful enough in their trading activities to recoup even their brokerage expenses.

The result of the study was consistent with the notion that expenses are offset by superior results (efficient markets in presence of costly information). Elton et al (1993) and Malkiel (1995) showed a negative relationship between total expenses and risk-adjusted net return. A negative relationship indicates that mutual funds that have a lower return tend to have a higher fee. One interpretation of this ought to be the fact that smaller companies tend to manage less capital and therefore need to take a higher fee in order to be able to gain revenue as compared to a larger company with more capital that can handle their management at a lower fee since their revenue will still be high enough.

Other literature has addressed issues such as fund managerial skills (passive vs. active managed fees) and before-fee performance vs. fees. Chevalier and Ellison (1999) showed that there is a tendency of difference in performance and managerial characteristics. Gil-Bazo and Ruiz-Verdu (2009) showed that funds with worse before-fee performance charge higher fees. In line with this, Gruber (1996) and Carhart (1997) showed a negative relation between a fund's operating expense ratio and performance. Managerial skill has been explained as alpha by many studies, which is referred to as "excess return" or "abnormal rate of return". Berk and Green (2004) studied the phenomenon that financial intermediaries are highly rewarded

despite the intense competition between them and the uncertainty whether they add value through their work. The study argues that if skill is in short supply, the competition between investors determines the net return in equilibrium, not the skill of managers.

Sharpe (1991) also showed that "after costs, the return on the average actively managed dollar will be less than the return on the average passively managed dollar for any time period". Furthermore, it was concluded that active fund managers underperform passive fund managers. This was due to the laws of arithmetic's where an active managed fund needs to have excess returns of over 2% in order to outperform the market and account for the average 1.19% management fees.

In contrast to the previously mentioned literature, new research shows that the reason why studies have failed to find evidence of managerial skill is that the traditional measures such as gross and net alpha fail to measure this (Berk and Binsbergen (2013)). The researchers argue that the more capital a fund receives the more difficult it will be for the fund manager to identify investment opportunities that are positive compared to the growing income of capital. With this, the average performance per dollar will decline until the alpha is driven to zero and the income will stop. This is the reason why the net alpha will not prevail and why alpha is not the most satisfactory measure of fund managerial skill. However, the gross alpha on its own does not give a valid estimate for managerial skill since the gross alpha is a return measure and not a value measure.

By measuring skill based on the amount of money the manager makes or loses there is an evidence of managerial skill. Berk and Binsbergen (2013) claim that the advantage of using their measure of value added is that it quantifies the amount of money the fund extracts from financial markets. What it does not measure is how the mutual fund company chooses to distribute this money. A manager that adds a gross alpha of 1% on a $10 billion fund adds more value than a manager that adds a gross alpha of 10% on a $1 million fund. The only condition under which the gross alpha will reliably differentiate managers is if all funds are the same size.

To our knowledge there have not been any studies conducted of value added on the Swedish market, which makes it interesting to apply this method on the Swedish fund market.

This thesis aim is to study whether managerial skill exists and if it has an impact on mutual fund performance. The hypothesis that is tested is whether managerial skill, in terms of value added, exists. The null hypothesis is that there is no managerial skill, thus the alternative hypothesis is that there exists managerial skill.

$H_0$: Managerial skill, defined as value added, does not exist.
$H_1$: Managerial skill, defined as value added, does exist.

To be notified, though this thesis might not cover all different aspects of managerial skill the hypothesis test will still address the most important aspects of the problem.

## 3. Theoretical Framework

### 3.1. Efficient Market Hypothesis

As mentioned in the introduction, the net alpha is not a measurement of the skill of the manager rather than it is the measurement of the abnormal return earned by investors. The intuition that Eugene Fama used to motivate the Efficient Market Hypothesis explains this: just as the expected return of a firm does not reflect the quality of its management, neither does the expected return of a mutual fund. Instead, what the net alpha measures is the rationality and competitiveness of capital market. If markets are competitive and investors rational, the net alpha would be zero. A positive net alpha implies that capital markets are not competitive and that the supply of capital is insufficient to compete away the abnormal return. A negative net alpha implies that investors are committing too much capital to active management.

The Efficient Market Hypothesis states that it is impossible to "beat the market" consistently on a risk-adjusted basis since market prices should only react to new information (Fama (1970)). Furthermore, Fama (1970) argued that stocks always trade at their fair value, making it impossible for investors to either purchase undervalued stocks or sell stocks for inflated prices. The efficient market hypothesis can be divided in to three forms: weak form, semi-strong form and strong form. The weak form states that all available public information is reflected in the prices of securities. Furthermore, historical prices, volume and returns does not affect future prices. The semi-strong form includes the assumptions of the weak form but also assumes that prices of securities adjust accordingly to new available public information and hence contributing to fundamental analysis lacking predictive power regarding movements of future prices. The strong form states that both public and private information is fully reflected in the prices of the securities, with both new and historical information as well as insider information.

As such, it should be impossible to outperform the overall market through expert stock selection or market timing, and that the only way an investor can possibly obtain higher returns is by chance or by purchasing riskier investments. However, the market will not be efficient 100% of the time and at any given year a mutual fund will outperform the market.

With this reasoning, it should be impossible to outperform the overall market through expert selection. This is in line with previous literature stating that stock picking by brokers have no benefit with respect to the cost of these (Sharpe (1966) and Bergstresser, Chalmers et Tufano (2007)). Furthermore, a paradox is introduced by Grossman and Stiglitz (1980) called the Stiglitz Grossman paradox with the idea that because information is costly, prices cannot perfectly reflect the information which is available, since if it did, those who spent resources to obtain it would receive no compensation, leading to the conclusion that an informationally efficient market is impossible.

Active fund managers often rely on inefficiencies and mispricing in the market in order to use their "stock-picking skills" and thus find stocks that will outperform the market. The Efficient Market Theory shows that stock prices fully reflect all available information and thus current market prices should be the best indication of a company's intrinsic value.

The hypothesis shows that no active investor can consistently beat the market over several period except by luck. This is in line with Morningstar's research where actively managed funds with higher costs tend to underperform lower-cost funds which are passively managed.

Relating to the hypothesis testing where we want to examine whether managerial skill exists, the form of the efficient market hypothesis that is most relevant is the strong form due to this form excluding any information not being available to the public and thus not reflected in the security pricing, making any abnormal return only skilled-based.

### 3.2. Alpha

Alpha is a term used to describe the ability of a strategy to beat the market. Therefore, alpha is also often referred to as "excess return" or "abnormal rate of return". These terms refer to the state that markets are efficient, thus there is no way to systematically earn returns that exceed the broad market. In finance, the term is a measure of performance, describing a strategy, trader or portfolio manager's ability to beat the market return. The net alpha is a measure to show the average abnormal return net of fees and expenses to assess whether managers have skill. However, Berk and Green (2004) argue, if skill is in short supply, the net alpha is determined in equilibrium by competition between investors, and not by the skill of managers.

A positive net alpha implies that there is no competition in capital markets, whereas a negative net alpha implies that a portion of the investors are irrational and thus are allocating too much capital to active management. The net alpha measures the investors rationality and the capital market's competitiveness. As furthermore argued by Berk and Binsbergen (2013), net alpha measures the abnormal return offered to investors in the fund, but it does not measure the skill of the manager of that fund. With this background, some argue that the gross alpha is a better measurement of managerial skill. However, the gross alpha is not a value measure but a return measure, and hence managerial skill does not, by itself, depend on the gross alpha. The only condition under which the gross alpha will reliably differentiate managers is if all funds are the same size (Berk and Binsbergen (2013)).

When discussing alpha, reference should be made to the "Joint Hypothesis Problem" where it is stated that when a model yields a return significantly different from the actual return, there is always uncertainty regarding if there exists an imperfection in the model or if the market is inefficient (Fama (1970)). Only by adding various factors to eliminate aberrations, can researchers alter their models with aspiration to fully explain the return within the model. With this in mind, alpha, or the aberration, functions as a signal to the model maker if it can perfectly predict returns by the factors in the model. However, according to the Joint Hypothesis, as long as alpha exists neither the conclusion of a flawed model nor market inefficiency can be drawn.

As Berk and Binsbergen (2013) points out, the most commonly used measure of skill in the literature is the unconditional mean of $\varepsilon_{it}$, or the net alpha, denoted by $\hat{\alpha}_i^n$. If the benchmark return is observed, the net alpha can be estimated by the following formula:

$$\hat{\alpha}_i^n = \frac{1}{T_i} \sum_{t=1}^{T_i} (R_{it}^n - R_{it}^B) = \frac{1}{T_i} \sum_{t=1}^{T_i} \varepsilon_{it} \qquad \text{(Equation 1)}$$

where $T_i$ is the number of periods that fund "i" appears in the database, $R_{it}^n$ is the return in excess of the risk-free rate earned by investors in the i'th fund at time t, $R_{it}^B$ is is the excess return of the investor's next best alternative investment opportunity and $\varepsilon_{it}$ is the deviation from the benchmark.

## 3.3. Value Added

The amount of capital retrieved from fees by the fund can only come from either investor's pockets or financial markets. According to Berk and Binsbergen (2013) the value added of a fund is calculated by subtracting the amount of money taken from investors from the fees charged, i.e. the money extracted from financial markets. The percentage fee multiplied by AUM plus the product of the return to investors in excess of the benchmark and AUM. This quantity is the fund's gross excess return over its benchmark multiplied by assets under management, what we term the value added of the fund. The variable fee is expressed as TER, which is the total expense ratio, including management fee and additional expenses such as trading fees, legal fees, auditor fees and other operational expenses.

The dollar value added by a fund over the benchmark is calculated by the following equation (Berk and Binsbergen (2013)):

$$V_{it} \equiv q_{i,t-1} \, (R_{it}^g - R_{it}^B) = q_{i,t-1} f_{i,t-1} + q_{i,t-1} \varepsilon_{it}, \qquad \text{(Equation 2)}$$

where $q_{i,t-1}$ is the assets under management, $R_{it}^g$ is the gross excess return, or the excess return the fund makes before it takes out the percentage fee, $R_{it}^B$ is the excess return of the investor's next best alternative investment opportunity, the term $(R_{it}^g - R_{it}^B)$ is the benchmark adjusted realized gross return and $f_{i,t-1}$ is the percentage fee and $\varepsilon_{it}$ is the deviation from the benchmark or the net alpha (also denoted by $\alpha_i^n$).

# 4. Methodology and Econometric Specification

This study aims to examine whether managerial skill exists. The null hypothesis states that managerial skill does not exist and thus the alternative hypothesis states that managerial skill does exists. Managerial skill is defined as value added, in line with Berk and Binsbergen (2013).

To measure the value that the fund either offers or draws from investors, Berk and Binsbergen (2013) compares their performance to the performance of the next best investment opportunity available to investors at the time, which they have termed the benchmark. This is all available Vanguard index funds (including funds that hold non-U.S. stocks). They benchmark managers against the investment opportunity set faced by a passive investor, in this case the net return of Vanguard's index funds. The study estimates average value added, $S_{it}$, for every fund in our sample. This is the time series expectation of value added ($V_{it}$): $S_i = E[V_{it}]$.

For a fund that exists for $T_i$ periods, the estimated value added is given by:

$$\hat{s}_i = \sum_{t=1}^{T_i} \frac{V_{it}}{T_i} \qquad \text{(Equation 3)}$$

In this study we use the same method as explained above when calculating average value added. We collect data on daily closing prices of open-end mutual funds primarily from each fund's respective webpage. If we do not find the daily closing prices from there, we collect data from the webpages of the major institutes but primary from Handelsbanken's webpage since they have a large range of funds as well as other Swedish banks. The data on the daily closing prices of index OMXSGI is collected from www.nasdaqomxnordic.com. This index includes all the shares listed on OMX Nordic Exchange Stockholm. The aim of the index is to reflect the current status and changes in the market. Dividends are re-invested in the index.

The data is collected from 1 January 2008 to 31 December 2017 which in total consists of 49 active mutual funds that has data we can download. This consists of approximately 2512 observations of daily closing prices and thus 120 monthly closing prices for those mutual

funds that have data the whole period of the time frame. Furthermore, we calculate the monthly return from these monthly closing prices and then the average monthly return.

The mutual funds studied are Swedish equity mutual funds that mainly compares its performance to one of these benchmarks: SIXRX, SIXPRX but in some cases SIX30RX and OMXBGI. Morningstar compares all Swedish equity mutual funds with MSCI Sweden, which corresponds to OMXS30. We choose to use OMXSGI as a benchmark since OMXS30 is an index composed of the 30 most traded stocks on Nasdaq Stockholm and does not consider re-investment of dividends.

In our data selection we have actively managed funds which mainly invest in large and mid-sized Swedish companies. The reasoning behind our selection is to have consistency regarding the investment strategy of the mutual funds.

The next step is to calculate the monthly net alpha of each fund. This is conducted by using equation 1. Further, we calculate the value added of each fund by using equation 2. The value added is calculated monthly of a 10-year period of each actively managed fund and then an estimated value added is calculated of each fund. The distribution of the estimated value added ($S_i$) and net alpha $\alpha_i^n$ is presented in Table 1.

When conducting the first step of our study to test whether there exists managerial skill, we use descriptive statistics with a one tailed t-test of value added. With this test we examine if the mutual funds add value in general regarding our dataset. The test is done with confidence interval of 95%. If we need to adjust the t-test of value added we do this by using another test by following previous literature and using the same method conducted by Berk and Binsbergen (2013).

To derive the alternative measure, we utilize the fact that under the strong form of the Null Hypothesis, value added cannot be persistent. In other words, the fund managers that have previously added value should not continue to add value in the future. If fund managers are skilled there should exist a difference in the skill set and the relative performance should be persistent through our observed period of 10 years. This will be tested by conducting a relative performance comparison by counting the number of times in the future (1) top managers beats bottom managers and (2) top managers are in the top half. Practically, this is

done by dividing our existing data in quartiles where the 4<sup>th</sup> quartile represents the top 25% mutual funds that has the highest 10-year monthly value added along with the associated 10-year monthly net alpha and the 1<sup>st</sup> quartile represent the bottom 25% mutual funds that has the lowest 10-year monthly value added along with the associated 10-year monthly net alpha. Furthermore, we report the average value added and net alpha of the top quartile at each horizon and the associated p-value. The p-value is calculated through a one-tailed t-test using Stata.

To avoid positively correlation in the error, which can be falsely conclusions and bias that persistence exists when it does not, we start our measurement horizon at year 3 which Berk and Binsbergen (2013) concludes is a sufficient length to produce reliable estimates.

The next step is to count the number of times that the top quartile beats the bottom quartile at each horizon and its associated p-value as well as counting the number of times that the top quartile is over the median which we call "top half". The results are shown in Table 2.

## 5. Results and discussion

The result of the first step of our study, whether managerial skill exists, shows a p-value of 0,5189 which indicates that we cannot reject the null hypothesis and thus, at first sight, we cannot find managerial skill in our data. An explanation of this can be that we have too little data resulting in the statistics not being t-distributed. The reason of the data being limited in terms of quantity is that these are all the available funds according to our selection. In order to adjust the t-test of value added we do this by using another test by following previous literature and using the same method conducted by Berk and Binsbergen (2013).

Table 1 shows the cross-sectional distribution of $S_i$ and the net alpha in the sample. In the first column it is shown that the average open-end mutual fund has an added value of -0,14 million SEK per month. The funds generated 101 million SEK per month at the 99th percentile and approximately -48 million SEK at the 1st percentile per month. The median open-end mutual fund lost an average of 0,98 million per month and only about 35% of the funds had a positive value added. In the second column it is shown that the average open-end mutual fund had a 10-year monthly net alpha of -0,14%. The funds generated 0,46% per month at the 99th percentile and approximately -0,59% at the 1st percentile per month. The median open-end fund had an average of -0,20% net alpha per month and only about 25% of the funds had a positive net alpha.

Table 1: Cross-sectional distribution of value added ($S_i$)

| | Value added | Net alpha |
|---|---|---|
| Cross-Sectional Mean | -0,14 | -0,14 |
| Standard Error of the Mean | 2,86 | 0,03 |
| t-Statistics | -0,05 | -4,67 |
| 1st Percentile | -47,7 | -0,59 |
| 5th Percentile | -23,3 | -0,43 |
| 10th Percentile | -20,8 | -0,34 |
| 25th Percentile | -4,64 | -0,28 |
| 50th Percentile | -0,98 | -0,20 |
| 75th Percentile | 2,87 | -0,00 |
| 90th Percentile | 19,1 | 0,18 |
| 95th Percentile | 25,6 | 0,24 |
| 99th Percentile | 101 | 0,46 |
| Percent with less than zero | 65,31% | 75,51% |
| No. of Funds | 49 | 49 |

The table presents the statistical properties of the distribution of the monthly value added and 10-year monthly net alpha. The properties that are presented are the cross-sectional mean, the standard error of the mean and the t-statistics. The values for value added are presented in million SEK and the values for net alpha are presented in percent.

In table 2 below we can see that there is strong evidence of persistency in value added as well as in the top in top half, up to 9 years, when looking at the p-value. We find that the top quartile outperforms the bottom quartile at each horizon, except for year 3. There might be two explanations for this: the first one is that the top fund managers create more value than bottom fund managers in the long term and the second one is the fact that three years might not be a sufficient length to produce reliable estimates in order to avoid positively correlation in the error, in contradiction of what Berk and Binsbergen (2013) states. There is strong evidence that managerial skill exists. However, in the long term, there is weak evidence that the managers cannot add more value than the market beyond a 10-year span. The null hypothesis that states that managerial skill, defined as value added, does not exist, can be rejected at a 95% confidence interval. The explanation of the calculations done to obtain the values in table 2 is under chapter 4.

## Table 2: Out-of-sample Performance of the Top Quartile

| Horizon | Value Added | | Top Outperforms Bottom | | Top in Top Half | |
|---|---|---|---|---|---|---|
| Years | MSEK | p-value | Freq. (%) | p-value | Freq. (%) | p-value |
| 3 | 26,58 | 0,0107 | 52,78 | 0,0790 | 69,44 | 0,0147 |
| 4 | 29,15 | 0,0035 | 56,25 | 0,0394 | 66,67 | 0,0064 |
| 5 | 25,47 | 0,0036 | 58,33 | 0,0256 | 65,00 | 0,0055 |
| 6 | 23,88 | 0,0059 | 62,50 | 0,0105 | 63,89 | 0,0080 |
| 7 | 16,53 | 0,0406 | 60,71 | 0,0178 | 58,33 | 0,0429 |
| 8 | 16,72 | 0,0410 | 61,46 | 0,0081 | 55,21 | 0,0400 |
| 9 | 24,81 | 0,0102 | 64,81 | 0,0013 | 57,41 | 0,0108 |
| 10 | 18,60 | 0,0683 | 63,03 | 0,0076 | 56,30 | 0,0750 |

The two columns labeled "Value Added" report the average value added of the top quartile at each horizon and the associated p-value. The next two columns report the fraction of the time and the associated p-value that the top quartile has a higher value added realization than the bottom quartile. The columns labeled "Top in Top Half" report the fraction of time the realized value added of the top quartile is in the top half, in emphasis how often the top quartile outperforms the median in terms of value added. All p-values are one tailed, that is, they represent the probability, under the Null Hypothesis, of the observed test-statistic value or greater. Value added is computed using OMXSGI index as benchmark.

Table 3 shows that there is persistency in net alpha up to year 5. The result can be an implication of the fact that, overall, the market beats an actively managed mutual fund in the long run. However, this is based on the interpretation of the raw numbers in table 3, and not on factors that may affect net alpha in the long run. If the total capital in the mutual fund would be constant, a skilled manager might be able to beat the market even in the long run. Investors can usually identify a skilled fund manager and hence will allocate more capital to that mutual fund, which drives the net alpha to zero, in line with Berk and Binsbergen (2013). Increase in capital makes it more difficult to find lucrative investment possibilities as well as it affects flexibility in the general portfolio management, in comparison of that of a smaller sized open-end mutual fund. These reasonings are based on the fact that we have strong evidence that mutual funds in the top quartile outperforms the bottom quartile at each horizon as well as being in the top half at each horizon. Top managers that have succeeded to deliver a higher net alpha tend to deliver a higher net alpha in the future as well, compared to bottom managers. If the argument of inflow in capital making it more difficult to find lucrative investment possibilities as well as the negative effect in flexibility in the general portfolio management holds true, then it must also hold true that the outflow of capital from the mutual

funds that are managed by less skilled managers should have a positive effect on the flexibility in the general portfolio management and thus having a positive effect on net alpha. However, even though this should hold, skilled managers with more capital inflow consistently outperforms the less skilled managers over time, at each time horizon. Another possible factor is the time frame, i.e. that a new fund manager might not achieve the results as the previous skilled fund manager had in the same mutual fund. Net alpha is a measure of abnormal return, not of skill, and is thus not a good indicator of fund managers skill. The fund manager might have skill and add value to the fund other than what is visible in terms of net alpha. Final, factors such as fees and luck can be a vague and easy explanation of the declining net alpha with time. The explanation of the calculations done to obtain the values in table 3 is under chapter 4.

Table 3: Out-of-sample Net Alpha of the Top Quartile

| Horizon | Net Alpha | | Top Outperforms Bottom | | Top in Top Half | |
|---|---|---|---|---|---|---|
| Years | b.p. | p-value | Freq. (%) | p-value | Freq. (%) | p-value |
| 3 | 20 | 0,0293 | 75,00 | 0,0021 | 72,22 | 0,0395 |
| 4 | 24 | 0,0084 | 75,00 | 0,0004 | 72,92 | 0,0170 |
| 5 | 20 | 0,0141 | 75,00 | 0,0002 | 73,33 | 0,0111 |
| 6 | 14 | 0,0545 | 72,22 | 0,0003 | 70,83 | 0,0290 |
| 7 | 10 | 0,0129 | 71,43 | 0,0005 | 70,24 | 0,0313 |
| 8 | 7 | 0,0181 | 71,88 | 0,0002 | 68,75 | 0,0364 |
| 9 | 12 | 0,0893 | 74,07 | 0,0000 | 69,44 | 0,0204 |
| 10 | 13 | 0,0123 | 73,11 | 0,0002 | 68,07 | 0,0449 |

The columns labeled "Net Alpha" report the weighted average net alpha (in b.p./month) of the top quartile at each horizon and the associated p-value. The next two columns report the fraction of the time and the associated p-value that the top quartile has a net alpha realization greater than the bottom quartile. The columns labeled "Top in Top Half" report the fraction of time the realized net alpha of the top quartile is in the top half, in emphasis how often the top quartile outperforms the median in terms of net alpha. All p-values are one tailed, that is, they represent the probability, under the Null Hypothesis, of the observed test-statistic value or greater. Net alpha is computed using OMXSGI index as benchmark.

## 6. Summary and conclusion

The main objective of this thesis is to explore whether managerial skill exists and if it has an impact on mutual fund performance. By using descriptive statistics to explore the relative performance in mutual funds the aim is to find evidence whether there exists persistency in value added.

We can reject the null hypothesis that managerial skill, defined as value added, does not exist. Since we can provide evidence of persistency in managerial skill, at least up to 9 years, it can be concluded that neither luck nor other unexplanatory factors should contribute to persistency in value added. Furthermore, there is strong evidence that top managers that have succeeded to deliver a higher net alpha tend to deliver a higher net alpha in the future as well, compared to bottom managers. Our findings suggest that managerial skill exists. The skill is measured as the value extracted from the market, not as the abnormal return.

In accordance with Berk and Binsbergen (2013) our results differ from previous studies. As Berk and Binsbergen (2013), we use a correct measurement for managerial skill by using value added, the benchmark OMXSGI to calculate fund alphas instead of using a risk model, as well as using all available Swedish equity mutual funds (excluding a few losses in terms of no available data).

Since we have a measurement horizon of 10 years, we cannot state that persistency in value added is consistent when longer time horizons are observed. According to Berk and Binsbergen (2013) there is proof that the higher inflow of capital a mutual fund receives the more difficult it is for the fund manager to find attractive investment opportunities, which drives net alpha to zero in the long term. Hence, the average performance per SEK invested will decline with more inflow. Alpha, being persistent in 5 years, might be an indication that investors can identify skilled managers and actively choose to invest in their mutual funds, which in turn drives their mutual funds alpha to zero even though the managers are skilled and are able to extract value from the market in the long term due to competition inefficiencies. We can draw conclusions that skill does exist but is not necessarily presented as net alpha, rather than how much value the fund manager creates. Better managers will probably always beat worse managers in terms of net alpha.

## 7. References

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