Lappeenranta University of Technology

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Finance

Hedge Funds – The Long/Short Investment Strategy

Bachelors Thesis

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1. Introduction

Hedge funds are feared by unknowing investors, as they are often associated with huge risks and high fees. Thus hedge funds are typically unregistered securities available to only a limited number of investors who are aware of the risks involved. (Bill Cleveland, Medical Economics). Hedge funds consist of pools of underlying securities just like mutual funds, but there are significant differences between these two types of funds. Hedge funds are often unregulated which means that they can invest in a wider selection of securities than mutual funds. The main difference, however, is that hedge funds use more sophisticated and risky techniques for investing. One of the typical strategies used by hedge funds is the long/short investment strategy. (http://www.barclayhedge.com) This means that in addition to taking long positions on winning stocks, hedge fund managers can short sell stocks in hopes of gaining profit from a possible decline in price. Other investing techniques used by hedge funds include leverage, arbitrage and investing in complex derivatives.

Hedge funds and the long/short investment strategy have been widely discussed and previous research on the topic has also been conducted. In 1995, Jess Lederman and Robert A. Klein studied hedge fund and portfolio strategies including the long/short strategy from an institutional investor's point of view. William Fung and David A. Hsieh presented new results on hedge fund performance in 1997. Their results indicated that hedge funds follow investment strategies that are far more dynamic than those of mutual funds, and five dominant strategies were identified, one of which is the long/short strategy. In a more recent paper in 2006, David Hsieh researched the possible reasons for long/short strategy out performance

and concluded that hedge funds with long/short strategies appear to derive excess performance because of privileged access to the stock loan market. However, one of the most recent studies has been conducted by Samuel Mansner and Markus M. Schmidt in 2009. Mansner and Schmidt researched the performance persistence of long/short hedge funds and surprisingly found very little persistence on an annual horizon. They also concluded that because of the high volatility of hedge fund returns, the best performing funds and worst performing funds tend to switch places often.

In this paper we will focus on the long/short investing strategy. We will explain the fundamentals of the strategy and discuss different methods of picking the potential losing and winning stocks for the long/short strategy. A fairly new type of fund will also be introduced, the 130/30 – long/short equity fund which shares characteristics of both long only mutual funds, and long/short hedge funds. The empirical aim of this paper is to examine the long/short strategy and study the performance of 130/30 equity funds and measure them against long only benchmark indexes. This will give us an idea of whether the long/short strategy implied in the 130/30 equity funds can produce out performance with respect to added risk.

2. The long/short investment strategy

Traditional stock investors and long only funds simply buy the stocks that they think will perform well in the future. The risk is that the bet could be wrong. Long/short funds have the ability to bet that the price of particular stocks will decline as well as incline. It is no longer a matter of simply being able to pick winning stocks, but also the added opportunity of picking losing stocks, and profiting from the drop in price. In general, the goal of an equity long/short strategy is to minimize market exposure and profit from the

change in the spread between two stocks. (http://www.barclayhedge.com). However, this can still be a very risky strategy as hedge funds are often highly levered. Adverse market movements can cause dramatic losses despite the added diversification of simultaneous long and short positions.

2.1 Short selling

When an investor takes a long position on a security, it means that the investor has bought that security hoping for an increase in price. Conversely, when the investor goes for a short position, a decrease in price is anticipated. Short selling means selling stocks that you do not own. In practice, this is done by borrowing the stocks from a broker. However, the short position needs to be closed by buying back the same number of borrowed shares that were sold earlier. If the price of those shares has dropped like anticipated, the investor buys them back at the new lower price and makes a profit on the difference.

2.2 Choosing stocks for the long/short fund

As long/short funds can be very volatile and the difference between the best and worst funds is deep, we assume that the success of the long/short investment strategy depends highly on the hedge fund manager and the strategy used for picking both winning and losing stocks. In addition to the solid and proven strategy based on pure fundamental analysis, there are other interesting strategies for picking stocks.

2.2.1 The contrarian strategy

The contrarian strategy is a fairly simple strategy used mostly by market neutral hedge funds where the fund manager seeks out funds that out

perform or under perform a given index over a period of time. The strategy is then to take a short position on the stocks that out performed and a long position on the under performing ones. Basically, a contrarian believes that the general crowd behavior of investors can lead to the miss pricing of stocks. As markets tend to overreact, widespread pessimism about a certain company can drive its stock price too low, understating the prospects for profits. (www.docstoc.com)

2.2.2 The GARP strategy

The growth at reasonable price strategy also known as GARP is a strategy somewhere between value investing and growth investing. While fund managers abiding by growth strategy are focused on a company's earnings growth and value investors favor company's with a price below their intrinsic value, growth at a reasonable price strategy aims at finding stocks that have good potential for growth and trade at a reasonable price. GARP investors usually hunt for company's that have performed well in the past couple of years and that also have some growth value. Because the GARP manager is investing in between growth and value, he will target companies with realistic growth rates of 10%-20%, instead of a growth of 20-50%. (http://www.valuestockplus.net/)

2.3 130/30- long/short equity fund

A need for a new type of fund has been structured for investors who wish to combine the traditional equity fund with a little extra risk and reward. The 130/30- long/short equity fund is a hybrid of a long only mutual fund and a long/short hedge fund. The 130/30 structure allows the fund manager to short sell 30% of stocks believed to under perform against the market. The proceeds from the sales are then used to leverage a 30% increase in the long position. This leaves the fund with a net market exposure of 100% long, but it also has a so called hedge fund edge to achieve excess returns

over the benchmark. These 130/30 funds are designed to shorten the gap between traditional equity and alternative investments, and unlike hedge funds, they are more easily available for private investors.

Why 130/30? Most structures of long short equity funds are between 120/20 and 140/40. Studies have shown that 130/30 has the optimum amount of leverage being able to capture the benefits of a long/short strategy without exposing the fund to huge amounts of risk, as pure long/short hedge funds can have levered structures up to 500%. (Ian Harvey, Pensions week, 2007)

3. Empirical analysis

3.1 Overview

For this thesis we have chosen to compare 130/30- long/short equity funds to long only portfolios in order to demonstrate and measure the possible out performing effects of the long/short strategy. We have chosen five 130/30 funds and their benchmark indexes which will serve as the long only portfolios. Three of the chosen funds operate in the U.S stock market, one is a global fund and one invests in the Finnish stock market.

3.2 Theoretical background

In order to analyze performance we have calculated the returns, beta coefficients, volatility, excess return, tracking error and information ratios for all of the funds and measured them up to the benchmark index for a period of three years. The daily values for all of the ratios and variables have been calculated using Microsoft Excels financial functions. Graphs of

the ratios have also been drawn up to allow clear demonstration of the ratios relative to the benchmark index.

3.2.1 The CAPM model and beta coefficient

The capital asset pricing model has been criticized for making unrealistic assumptions and being too simple. However, in order to create a model on how assets are priced, it is necessary to seek out the most important elements from a complex situation and focus only on them. Certain assumptions must be made to achieve this focus:

1. Investors evaluate portfolios on a one period horizon by looking at expected returns and standard deviations.
2. When given the choice between two portfolios with the same standard deviations, investors will choose the one with higher expected return.
3. Investors are risk averse. Out of two portfolios with identical expected return, the investor will choose the portfolio with lower standard deviation.
4. Individual assets can be divided infinitely.
5. Investors can either lend or borrow money at a risk free rate.
6. Taxes and transaction costs are irrelevant. (Sharpe et Al., 1999)

According to the CAPM model, the expected return of an asset is defined as follows:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

In the formula, $E(R_i)$ is the expected return of the asset, β_i is the measure of the assets sensitivity to the changes of the market portfolio, $E(R_m)$ is the expected return on the market portfolio and R_f is the risk free rate. (Niskanen & Niskanen, 2000)

The beta coefficient in the CAPM model can be calculated by dividing the covariance of the assets expected return and the market portfolios expected return by the variance of the market: (Sharpe et Al., 1999)

$$\beta_i = \frac{\mathrm{Cov}(R_i, R_m)}{\mathrm{Var}(R_m)}$$

According to the capital asset pricing model, there is a linear relationship between variance and expected return. The expected return on an asset depends on its systematic risk, beta, and the investor is not compensated from specific risk. This is because while specific risk can be reduced by diversification, systematic risk cannot be diversified away.

The CAPM model defines the security market line where all of the securities on the market are in the state of the CAPM model based equilibrium. (Niskanen & Niskanen, 2000)

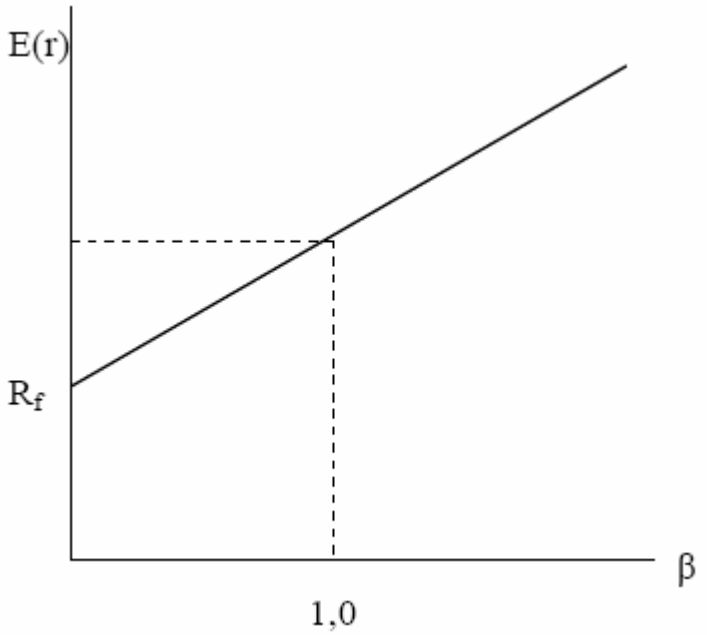


Figure 1. SML, the security market line.

The security market line is usually known as the relationship between covariance and expected return but covariance can also be expressed with beta, as shown in Figure 1. According to the security market line, the greater the systematic risk of a security, the greater the expected return. The beta of the market portfolio is equal to 1. Betas of individual securities range on both sides of the market portfolios beta. Securities with beta higher than 1 are considered riskier than the market portfolio and securities with a beta smaller than 1 are less risky. (Sharpe et Al., 1999)

3.2.3 Volatility

Volatility is the standard deviation or variance of a security's returns. It is simply a measure of the degree of price movement in a stock, futures contract or any other security. A price series or economic indicator that fluctuates widely can be called volatile. An accurate estimate in volatility is often crucial in many areas of finance such as risk management and measurement as well as hedging and option pricing. (Stock price volatility, Kotze, 2005)

3.2.4 Tracking error

Tracking error is calculated as the standard deviation of the difference between the fund and index returns, in other words, the standard deviation of the funds excess return. While some funds aim at replicating the risk and return of a benchmark, other funds are actively managed to produce out performance or lower transaction costs. Index replicating funds are expected to have a tracking error close to zero, while actively managed funds have a higher tracking error. (www.investopedia.com)

3.2.5 Information ratio

The information ratio is a measure of risk adjusted return of an asset or portfolio. It can be calculated by dividing the expected active return of a portfolio by tracking error. The expected active return of a portfolio is the difference between the return of the portfolio and the return of the benchmark. The information ratio is a great tool for measuring the competence of a fund manager and the performance of a fund. It differs from the better known Sharpe ratio in that while the Sharpe ratio compares the excess return of an asset to a risk free rate of return, the information ratio compares excess return relative to a benchmark index. The higher the information ratio, the better the performance of the fund. According to statistics, the best portfolio managers typically achieve information ratios of around 0, 5. (Richard C. Grinold & Ronald N. Kahn, Active Portfolio Management)

3.3 Results

3.3.1 BNY Mel US Core EQ 130/30

The first fund under inspection is the BNY Mel US 130/30 fund that is an open end fund incorporated in the US. The funds objective is capital appreciation and it invests at least 80% of its net assets in equity securities. The fund mostly focuses on growth and value stocks of large companies. (www.bloomberg.com)

The inspection horizon we have chosen for the BNY Mel US fund is the 3rd of August 2007 through to the 15th of October 2009. The fund uses the S&P -500 index as a benchmark and the same time horizon has been used

on the index in order to compare performance. Table 1. shows the computed results for the BNY fund.

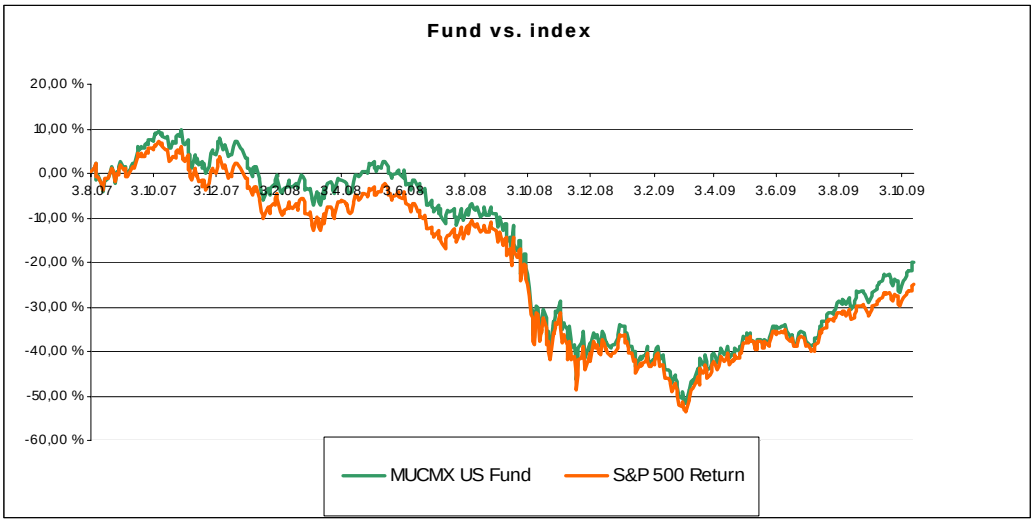
Table 1. BNY Mel US Fund 3.8.2007 – 15.11.2009

RATIO	BNY Mel US Fund	S&P – 500 Index
Return	-19,98%	-25,00%
Volatility	34,22%	33,94%
Beta	1,00	
Tracking error	14,98%	
Information ratio	0,33	

The results show that both the fund and the index have suffered greatly from the global financial crisis, with astonishing negative returns. However, we are looking at relative performance here.

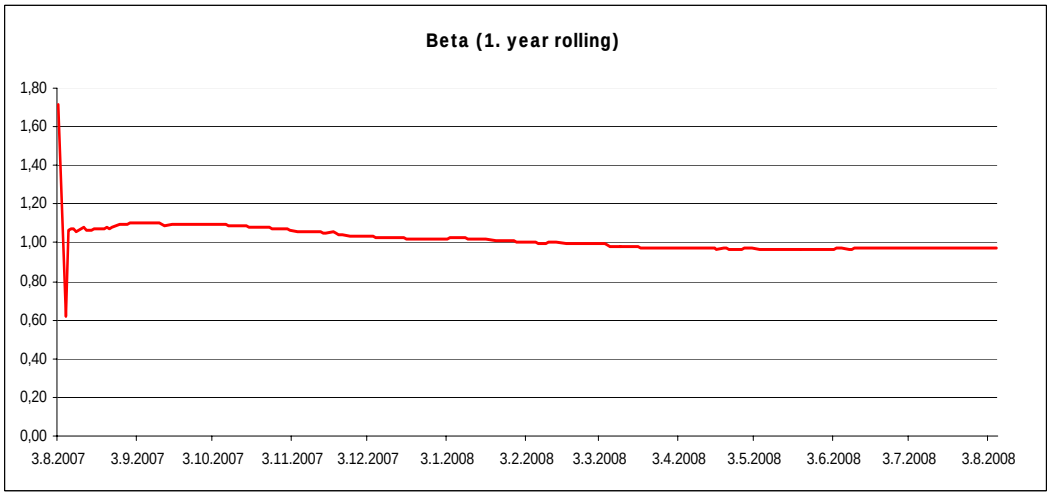
The BNY Mel Us Fund clearly beat the benchmark with a drop of “only” -19,98% during the three year period, while the indexes returns plummeted by a staggering 25%. Figure 2. shows the movements of the fund and the index during the selected time horizon. The graph clearly states that the fund follows the index fairly closely, but at all times with a higher rate of return.

Figure 2. BNY Mel US Fund vs. S&P 500 –index



Now that we have established the funds superiority in returns, let's focus on risk. How much extra risk comes with the long/short process? The fund seems to be only slightly more volatile than the index. The beta of the BNY fund has sailed on both sides of 1 during the time period as illustrated in figure 3.

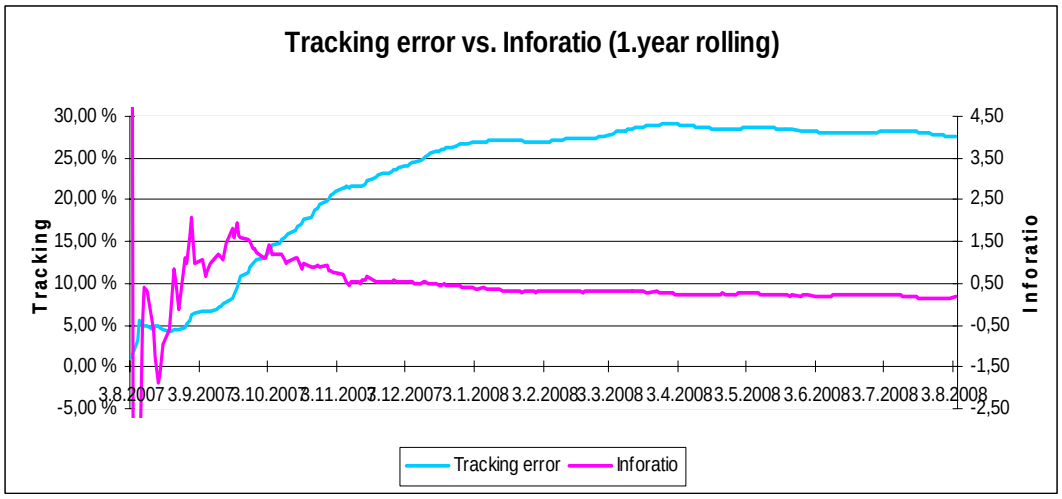
Figure 3. Beta



As determined before, beta is a measure of systematic risk that can not be diversified away. The beta of the BNY for one year is rolling towards 1, which is the beta of the entire stock market. The fund appears to follow the overall markets while generating excess returns.

The information ratio and tracking error are also plotted in a graph shown in figure 4.

Figure 4. Tracking error and information ratio



The results clearly show a high tracking error of over 14%. This is logical, as there was a significant difference in the returns of the fund and the benchmark. The information ratio, which was created by William Sharpe to evaluate performance relative to benchmarks, settled on 0,33 at the end of the time horizon. This is a fairly good for the information ratio, and as concluded before, top fund managers receive values up to 0,5.

Overall, the BNY Mel Us 130/30 Fund performed well relative to the index. The fund managed to retain fairly steady returns throughout the evaluation period, and out performed the index clearly. So far the long/short strategy seems to be worth all the hype.

3.3.2. DWS Invest Global Equities 130/30

The DWS Invest Global Equities is an open end fund incorporated in Luxembourgh. The funds objective is to maximize capital appreciation and over 80% of its assets are invested in equities worldwide. (www.bloomberg.com)

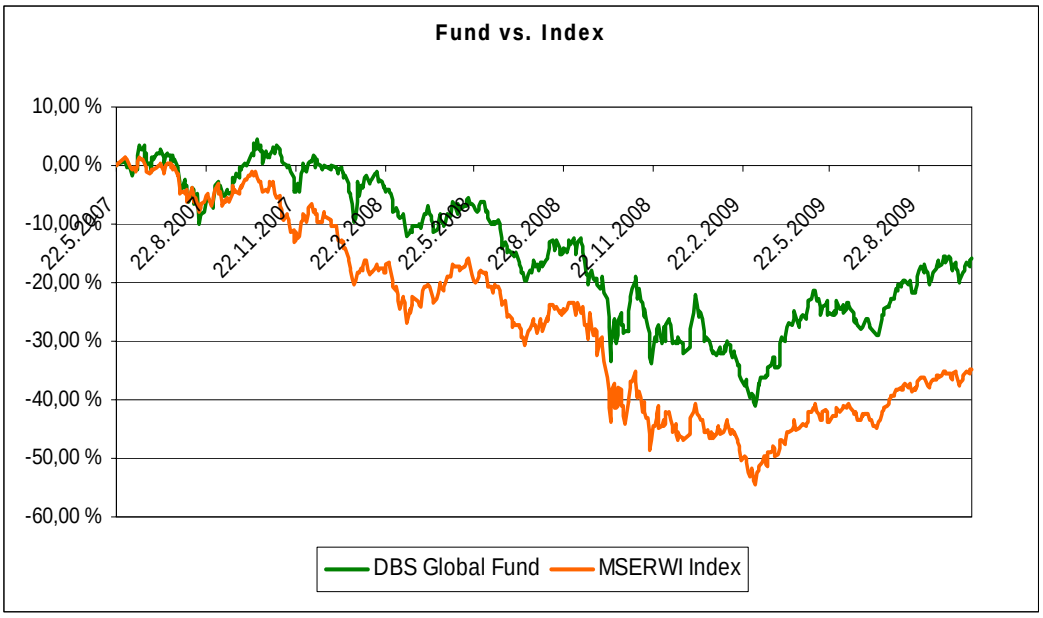
The time horizon for the DWS fund and the benchmark, the Morgan Stanley Capital International World Index (MSERWI) is the 22nd of May 2007 to the 15th of October 2009. Table 2. illustrates the computed results for the DWS Global fund.

Table 2. DWS Global Fund 22.5.2009 – 15.10.2009

RATIO	DWS Global Fund	MSERW Index
Return	-15,96%	-34,69%
Volatility	22,78%	24,51%
Beta	0,51	
Tracking error	30,93%	
Information ratio	0,61	

The results in the case of the DWS Global fund are obvious. Again, both the fund and the index have plummeted, but the 130/30 fund shows enourmous excess returns with less volatility and beta of only 0,51. Figure 5. further illustrates the relationship between the funds returns and those of the benchmark.

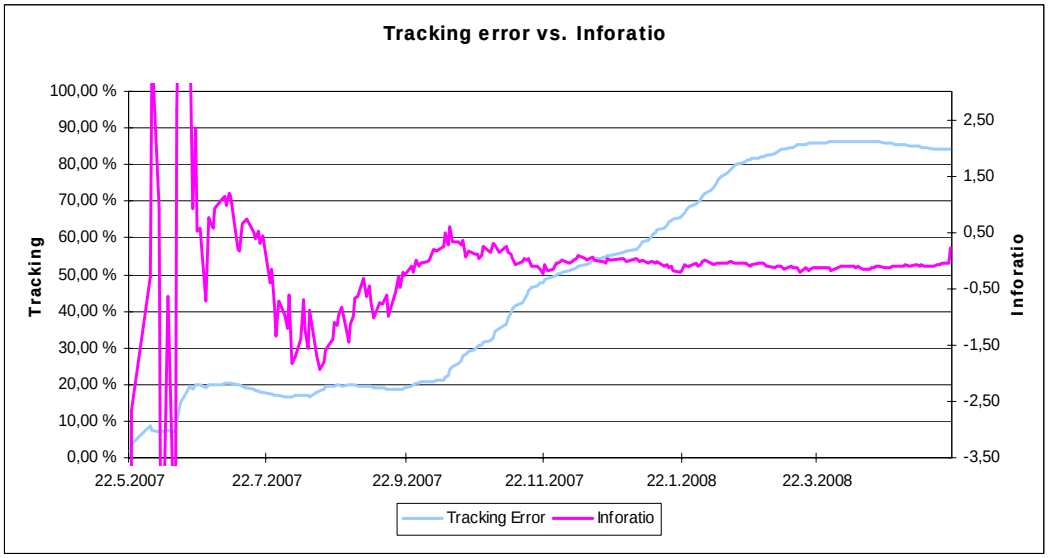
Figure 5. DWS Global Fund vs. Index



The fund again follows the general movements of the benchmark closely, but with considerably higher rates of return.

Figure 6. shows the information ratio and tracking error plotted together in one graph. With an information ratio of 0,61 and tracking error of up to 30,93% the fund shows excellent performance with regards to risk.

Figure 6. Information ratio and tracking error



According to the results, the DWS Global fund has been very successful relative to the index. Although the returns are still shockingly negative, the long only benchmark has once again been outperformed by the long/short strategy.

3.3.3 Fidelity Advisor 130/30 Large Cap Fund

The Fidelity Advisor 130/30 is also an open end fund incorporated in the US with a focus on achieving long term growth of capital. The fund normally invests 80% of its assets in common stocks of companies with large market capitalizations. (www.bloomberg.com).

The time horizon for the Fidelity fund and the benchmark S&P 500 index is slightly shorter than for the other funds, the 6th of April 2008 through 15th of October 2009. Table 3. shows the computed results for the Fidelity fund.

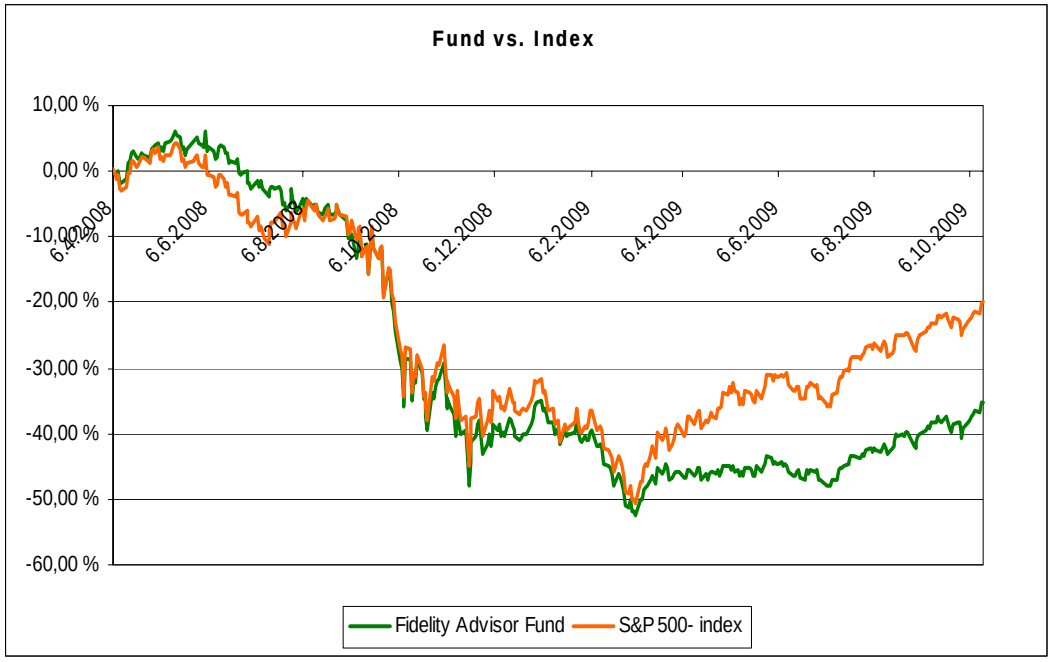
Table 3. The Fidelity Advisor fund 6.4.2008 – 15.10.2009

RATIO	Fidelity Advisor fund	S&P -500 Index
Return	-35,37%	-19,89%
Volatility	34,75%	38,10%
Beta	0,89	
Tracking error	87,88%	
Information ratio	-0,22	

The results from the Fidelity Advisor fund are surprising. In this case the fund has severely underperformed against the S&P -500 index. The fidelity funds returns decreased over 35% during a period not much longer than one year, while the benchmark only plummeted 20%. The funds returns were less volatile than those of the benchmark and the fund seems to react to the market in moderation with a beta of 0,89. Figure 6 once again

illustrates the movements of the Fidelity funds returns against the benchmark.

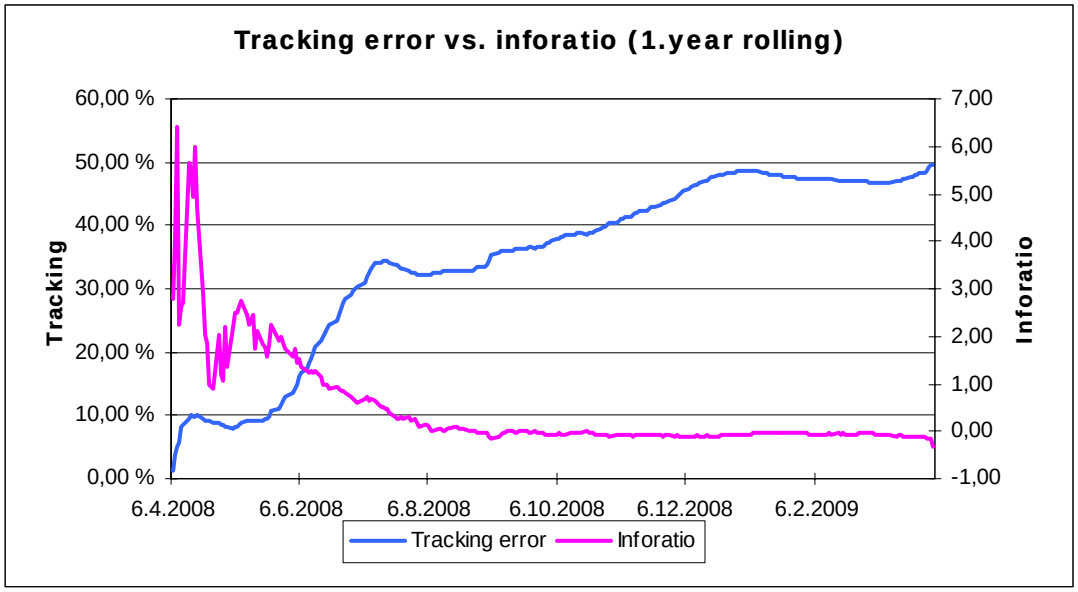
Figure 6. Fidelity Advisor Fund vs. Index



The graph shows the 130/30 fund starting out strong. In August of 2008, both the index and the Fidelity fund begin to drop at approximately the same rate. However, in March 2009 the benchmark seems to recover better than the Fidelity fund. There is a considerable difference in the returns of the index and the fund from that point onwards.

Figure 7. allows us to examine the tracking error and information ratio of the Fidelity fund.

Figure 7. Tracking error and information ratio



The results give us a negative information ratio of -0,22 and tracking error of 87,88%. The information ratio gives us negative values in this case because of the negative excess returns in the nominator. The results also show a very high tracking error, as the difference in returns is great.

The Fidelity Advisor fund was clearly a disappointment. With the fund performing under the benchmark by this much, fingers are often pointed at the fund manager. These results show the downside of the long/short strategy. Like any other strategy, it is no good if timing is off and wrong investment decisions are made.

3.3.4 JPMorgan Funds – US 130/30

The JP Morgan 130/30 Fund is an open end fund also incorporated in Luxembourg. The fund aims at providing capital growth through exposure to U.S companies by direct investments in securities of such companies and through the use of derivatives.

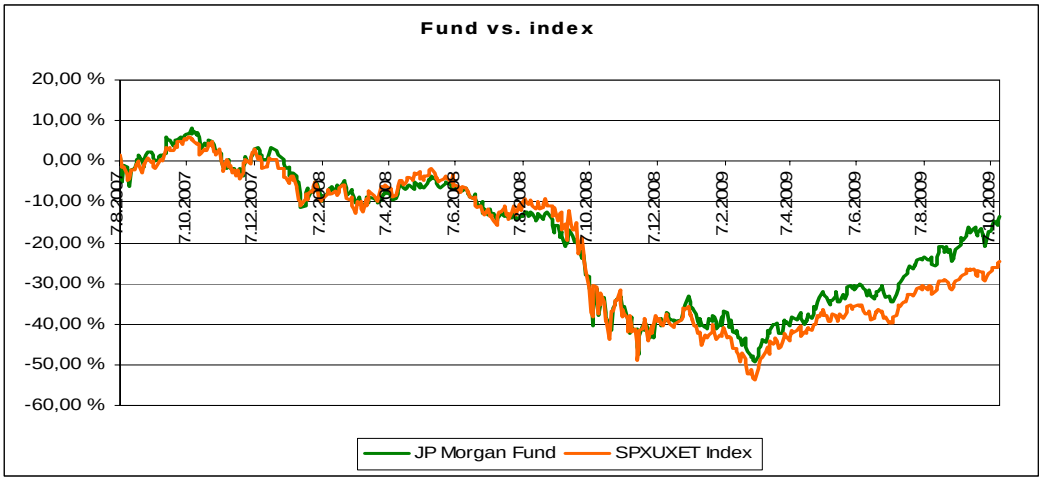
The time period for the JPMorgan fund is between the 7th of August 2007 and the 15th of October 2009. JPMorgan fund uses the SPXUXET index as a benchmark. We have once again drawn up a table for the computed results. Table 4. shows the ratios for the JPMorgan fund.

Table 4. JPMorgan Funds US 7.8.2007 – 15.10.2009

RATIOS	JPMorgan Fund	SPXUXET Index
Return	-13,71%	-24,58%
Volatility	31,39%	34,80%
Beta	0,23	
Tracking error	40,37%	
Information ratio	0,40	

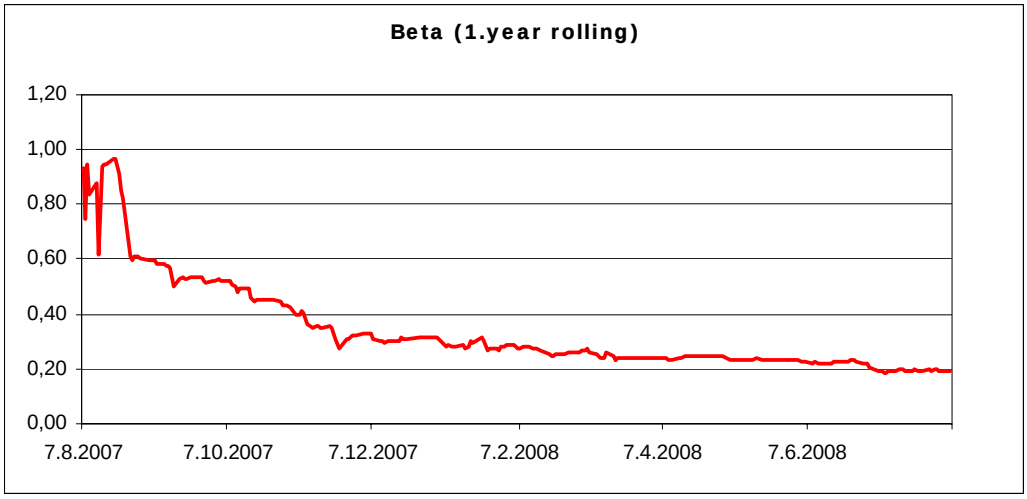
The long/short strategy appears to have worked for the JPMorgan fund. Looking at returns, the fund has beaten the index by over 10%. The fund was also able to produce less volatile returns, with a volatility of 31,39% in the selected time horizon. Figure 8 allows us once again to examine the movements of the fund and the benchmark.

Figure 8. JPMorgan fund vs. Index



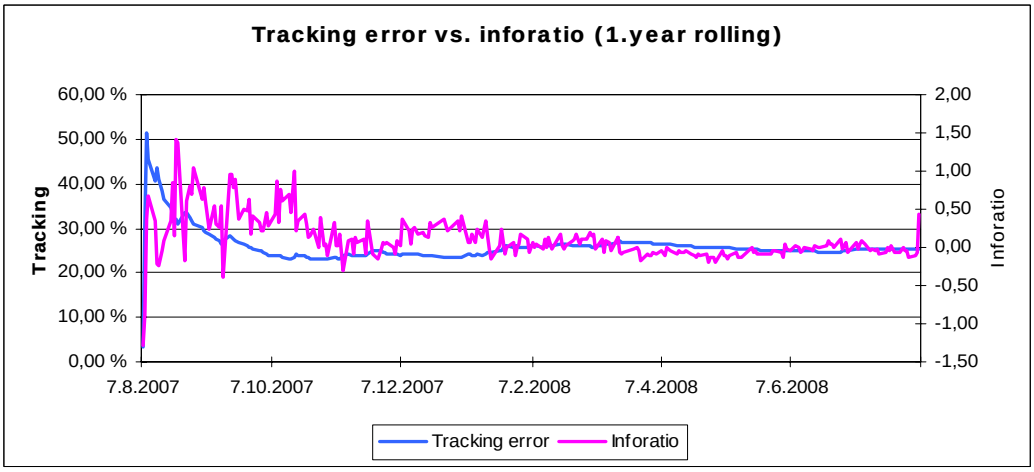
The fund and the index seem to be neck and neck for the first two years of the valuation period. In early 2009 after a drop in both the fund and the index, the JPMorgan fund recovers better, out performing the benchmark through the rest of 2009. The JPMorgan fund has a relatively low beta of 0,23 at the end of the time period. This means that the fund is not very sensitive to changes in the market portfolio, in this case the index. The development of the funds beta can be seen in Figure 9.

Figure 9. 1.year rolling beta for the JPMorgan fund



The JPMorgan fund also received a decently high information ratio of 0,4. Figure 10. Illustrates the information ratio and tracking error for further inspection.

Figure 10. Tracking error and information ratio



The graph shows the information ratio developing on both sides of zero, ultimately settling on 0,4 at the end of the time horizon. Tracking error for the fund was at a medium high of around 40%, this supports the vast difference in returns and low beta. Overall, the JPMorgan fund performed well and once again the long/short strategy has been proven effective.

3.3.5 Nordea Finnish 130/30 Equity Fund

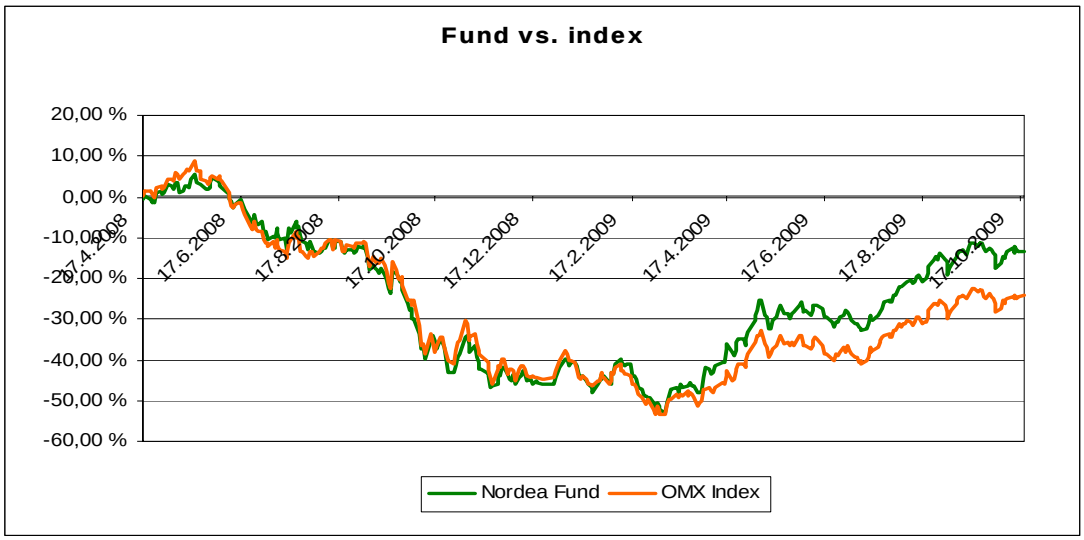
The Nordea Finnish 130/30 Equity Fund is an open end fund that aims at long term capital appreciation through investments in the Finnish stocks and stock derivatives. The Nordea fund is compared to the OMX Helsinki CAP GTR –index and the time horizon for valuation is between the 17th of April 2008 and the 19th of October 2009.
The results for the performance of the Nordea fund are shown in Figure 5.

Figure 5. Nordea Finnish Equity Fund 17.4.2008 – 19.10.2009

RATIO	Nordea Equity Fund	OMX Helsinki CAP -index
Return	-13,21%	-24,13%
Volatility	33,35%	35,32%
Beta	0,82	
Tracking error	19,42%	
Information ratio	4,47	

The Nordea Finnish Equity fund was not unlike the other long/short funds in terms of performance. Once again, the long/short strategy produced excess returns of over 10% during the time horizon, also with lower volatility. The computed beta was 0,82 which means that the Nordea fund appears to follows the market with semi-strong sensitivity.

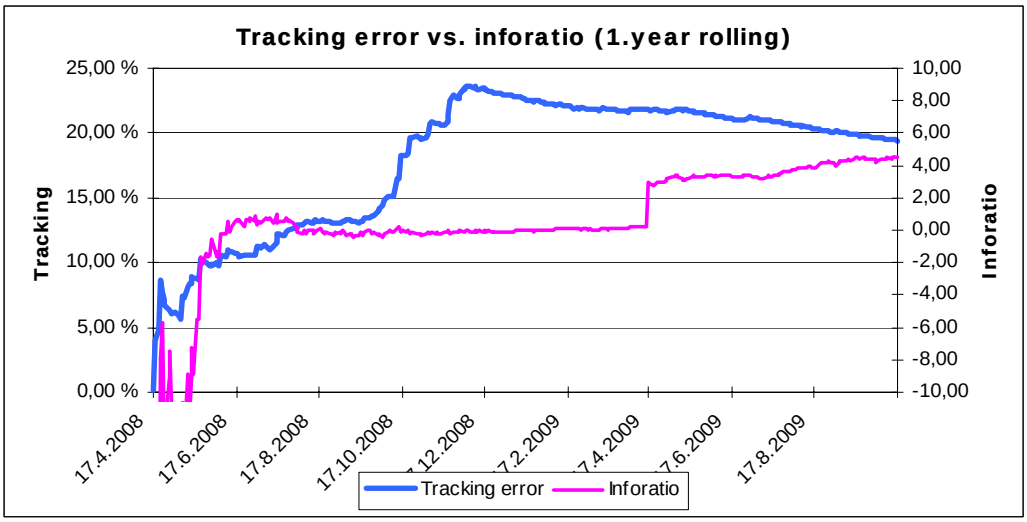
Figure 11. The Nordea Fund vs. Index



The same downward slope is visible in all of the funds that have been analyzed. The Nordea fund is no exception, but it also seemed to recover from the drop better than the index, out performing the benchmark with flying colors.

Figure 12 shows us the relationship between the information ratio and tracking error

Figure 12. Information ratio and tracking error



The astonishing information ratio of 4,47 makes the Nordea fund stand out amongst the others. The high value for the ratio is due to the relatively low tracking error in the denominator. The high information ratio and excess returns indicate that the Nordea fund has done extremely well.

4. Conclusion

Out of the five funds examined in this thesis, one fund underperformed against the index. All of the other funds out clearly outperformed, and showed relatively low volatility. The information ratio proved to be a good evaluation tool, giving the four successful funds positive ratios and one unsuccessful fund a negative ratio. Although all of the funds were examined during a period of deep recession, relative performance was notable. It would also be interesting to see similar empirical analysis done during an economic boom.

Based on these funds investing in the global market, U.S markets and Finnish market, the long/short strategy appears to have positive effects on portfolio performance.

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