Hedge Funds – Trend Following in Futures Markets

Bachelor Thesis in Quantitative Finance

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Executive Summary

Problem Description

In the recent past hedge funds and Commodity Trading Advisors (CTAs) have gained increasing popularity. Not only has the number of funds increased, but also their assets under management. This growth can mainly be attributed to the hedge funds' extraordinary return profiles and their low correlations to traditional investments. Additional to this fast growth, the strategies which hedge funds employ have also gained in scope. Especially trend following techniques are experiencing increasing popularity with the growth of faster and more reliable information technology. However alluring the high returns are, hedge funds have some pitfalls as well. As the Long Term Capital Management incident in 1998 showed, hedge funds can be subject to risks that regular mutual funds and stocks are not exposed to. Such specific risks have to be analyzed carefully. A hedge fund can, for example, increase its returns through extensive use of leverage. However, such leverage also emphasizes losses. For these reasons, hedge fund performance should be regarded using risk adjusted return measures. Using such measures, the returns of different strategies can be compared to the returns of traditional investments. The comparison can be done with stock, commodity and real estate indices as well as mutual funds. The comparison raises another issue. Hedge fund returns are subject to several biases, which are not all present in returns of traditional investments. These biases have to be carefully interpreted and controlled for. However, academics seem to have difficulties agreeing on which direction returns are biased towards, and whether or not the biases are significant at all. Finally, an empirical investigation into two trend following strategies should give some insight, into whether such a strategy can achieve higher returns than just buying and holding the asset outright.

Procedure

This paper is structured into eight parts. The first two parts give an introduction and a general overview of hedge funds. Defining a hedge fund poses the first problem, as there is not one universally accepted definition. A legal

body, such as the Securities and Exchange Commission (SEC), could possibly impose a definition upon the industry. However, because hedge funds are not required to register with the SEC this would be of little use. The fee structure is also examined as one of the major factors usually mentioned in the definition of hedge funds. Further, the aim to achieve absolute returns as compared to relative returns is looked at. Part three analyzes the Efficient Market Hypothesis (EMH). Some hedge funds seek their profit in market inefficiencies. Thus, whether the EMH holds in its three forms is of crucial importance to them. Other very important factors are the risks that hedge funds are exposed to. They are not necessarily the same as those for traditional investments. Therefore, the traditional and specific risks are separately analyzed in part four of this paper. The different investment strategies applied by hedge funds are compared in part five. Special focus is put on the strategy trend following. Part six compares the returns of the different hedge fund strategies to each other. Further, risk adjusted return measures are used to compare hedge fund returns to those of traditional investments. Part seven empirically investigates the returns produced by two trend following strategies, namely moving average and moving average convergence/divergence. For this purpose a virtual portfolio is set up, which buys the assets according to the signals produced by the trend following strategy.

Results

The performance comparison across the different hedge fund strategies shows the wide range of returns the strategies produce. This is in line with the fact that a wide variety of strategies exist, often sharing as little as the fee structure. The returns produced by these strategies range from -4.76 per cent to +18.95 per cent on the basis of compound annual growth rates (CAGR). Interesting is the fact that the only strategy producing negative returns is that of short selling. For a comparison of hedge fund returns with those of traditional investments the Sharpe ratio is used as a risk adjusted return measure. The comparison with stock indices shows that the hedge fund indices perform better on a risk adjusted basis. The Sharpe ratios of the hedge fund indices range from 0.2841

to 0.3586, whereas those for the stock indices range from 0.0740 to 0.1292. A similar result is observed for the comparison with two commodity indices and a real estate index. The resulting Sharpe ratios are 0.0840 and 0.2103 for the Goldman Sachs Commodity Index and the Rogers International Commodity Index respectively. The real estate index achieves a Sharpe ratio of 0.2691. None of these indices performs better than any of the hedge fund indices on a risk adjusted basis. A further comparison with mutual funds results in Sharpe ratios of 0.0741, 0.0801, and 0.1257 for US, Global, and European equity funds respectively.

The construction of the virtual portfolios was done using the two trend following strategies Moving Average Long Only (MALO) and Moving Average Convergence/Divergence (MACD). The MALO strategy buys the assets when a buy signal is produced by a thirty day moving average and sells them when a sell signal is produced by the same. This strategy can only buy and sell the assets, but never sell them short. Similarly, the MACD strategy buys and sells assets according to signals, but can never sell them short. The returns of those two strategies are compared to the buy and hold strategy. This strategy buys the assets on the first day a buy signal is produced by the MALO or the MACD strategy respectively. It then holds them until the end of the observation period. Both, the MALO and the MACD strategy outperform the buy and hold strategy. The return of the MALO strategy is 14.49 per cent as compared to 9.74 per cent of the buy and hold strategy. The MACD achieved a return of 14.90 per cent compared to the 10.54 per cent achieved by the buy and hold strategy. All percentages are in terms of CAGR.

General Evaluation

The results obtained in the the empirical investigation imply that hedge funds outperform traditional investments. The Sharpe ratios are higher for the hedge fund indices than for any of the traditional indices or mutual funds.

However, the fact that hedge fund returns are not normally distributed can lead to unclear results. The fat tail risks of hedge funds could mean that the use of traditional risk measures, such as the standard deviation, distorts the resulting Sharpe ratios. Further, the several biases involved in reported hedge fund returns could adjust their performance downward. However, the direction and significance of these biases is controversial. Finally, transaction costs were not considered in the empirical investigation. Therefore, the resulting returns would be lower than those obtained here. An exact comparison of hedge funds with other investments would require the inclusion of all these factors.