



**UNIVERSITY OF GOTHENBURG**  
**SCHOOL OF BUSINESS, ECONOMICS AND LAW**

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## **HEDGE FUND PERFORMANCE IN SWEDEN**

*A Comparative Study Between Swedish and European Hedge Funds*

Agnes Malmcrona and Julia Pohjanen

Supervisor: Naoaki Minamihashi

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## **Abstract**

The purpose of this thesis is to investigate the performance of Swedish hedge funds in relation to European hedge funds. Different strategies and characteristics will be analysed in order to enable the comparison. Quantitative data has been extracted to calculate risk and return measurements as well as to conduct multiple regressions. The hedge funds in Sweden have been found to be less expensive, less risky and active longer than the European hedge funds. By analysing the results, evidence for important characteristics for the performance of hedge funds have been established and the Swedish hedge funds overall have been found to outperform European hedge funds. However, the same evidence cannot be found for the strategies when examining their return separately. Finally, the result is not sufficient enough to state why Swedish hedge funds outperform European hedge funds.

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# 1. Introduction

The hedge fund industry started to develop in 1949 when Alfred Winslow Jones created a fund that used both leverage and was hedged from market movements. The public market of hedge funds did not develop until 1990s when the global hedge fund market consisted of around 500 funds (Fichtner, 2013). Today, the hedge fund industry has become a substantial part of the financial markets around the world. The Financial Conduct Authority, a supervision of hedge funds in the United Kingdom, reported in June 2015 the total amount of hedge fund assets under management to be USD 3.1 trillion in 2014 on a global scale. The total asset under management in the European hedge fund industry was USD 640 billion in the same year (J.P. Morgan, 2015).

The Swedish hedge fund market is still fairly young (Nordnet, 2015). In 1996, Brummer and Partners introduced the first Swedish hedge fund called Zenit, which is still active (Brummer & Partners, 2015). Ever since, the Swedish hedge fund market has expanded and in 2014, there were almost 80 active hedge funds in Sweden (Söderberg and Partners, 2015). Similarly, the global hedge fund market has grown rapidly and today there is an increased availability to international investors (Sveriges Riksbank, 2006). Even if the hedge fund industry has grown, only 1 % of the global financial market is represented by this alternative investment (Fichtner, 2013).

Swedish hedge funds have been active for about twenty years and could therefore be an established, developed market. Due to the increased opportunity to invest in foreign hedge funds, it is of relevance to analyse whether the Swedish hedge fund can compete with the European ones. Additionally, Europe has developed to a continent with strong relations due to the Euro and the European Union, which could affect the performance opportunity of the investments in the area. This leads to the interesting question whether the European or Swedish hedge funds are preferable for investment purposes due to superior performance. To contribute to the hedge fund discussion, this paper includes the Swedish perspective and makes a comparison to European hedge funds. This comparative study might be a great asset for investors and institutions in Sweden.

In this thesis, evidence has been found for Swedish hedge funds to generate higher return than European hedge funds. On the other hand, when investigating the hedge funds by investment

strategy, no superior performance for Swedish hedge funds can be stated. To analyse the difference in hedge fund characteristics between the two regions, several independent means t-test has been conducted. From this, Swedish hedge funds have been found to be less expensive, less risky and active longer than their European counterparts. By running an OLS regression, the importance of the included characteristics for the return of the hedge funds is investigated. Risk, the Swedish dummy and management fee have been found to have a positive effect on the return, while age has a negative effect. The strategy CTA/Managed Futures and the strategy Macro perform less than the strategy Equity Hedge. From these results, an analysis on why the Swedish hedge funds outperform the European hedge funds has been conducted. However, no clear explanation can be stated for the superior performance in Sweden based on the included characteristics, and therefore subjects suitable for further reaches is discussed.

The following piece will offer an outline for the construction of this thesis. Section 2 will present the theoretical background, including the definition of a hedge fund, an explanation of different investment strategies and hypothesis conducted with the purpose of explaining why the funds in one region might outperform the other. Section 3 states the research question this thesis will analyse, followed by a description of previous literature on the subject of hedge fund performance and hedge fund characteristics. The next sections present the data management and methodology used. Finally, a description of the results is conducted, followed by the last section with a summary conclusion along with suggested further research.

## **2. Theoretical Background**

To be able to continue, it is of relevance to define a Swedish hedge fund as well as a European hedge fund. The difference is simply the country of domicile of the fund. This is Sweden for the Swedish hedge funds and a European country, except Sweden, for the European hedge funds. Countries included are all having at least one hedge fund operating with one of the investment strategies chosen for this paper.

### **2.1 Definition of a Hedge Fund**

Hedge funds have the goal to perform uncorrelated with the market and thereby generate positive profits unconditional to the market situation. They are alternative investments with

fewer regulations than mutual funds and can therefore invest in other types of assets using different methods, such as derivatives and the usage of leverage. This enables them to generate high return, but also associates them with higher risk. Unlike mutual funds, hedge funds also use high level of minimum investment amount. Their availability is therefore limited to a small number of investors, such as investors with high wealth and institutional investors (Barclay Hedge, 2015a).

The fee structure is an important characteristic of the hedge fund that differs them from the mutual funds. This typically consists of a management fee and a performance fee. The management fee is 1-2 % per year of the invested amount and the performance fee is usually between 10-20 % of the return. Additionally, the hedge funds can have a high-water mark, which means that the performance fee will not be taken until the earlier losses have been gained back (Ackermann, McEnally & Ravenscraft, 1999).

## 2.2 Hedge Fund Strategies

Hedge funds use diverse investment strategies, which all differ in their risk and investment structure. Listed below are the most commonly used strategies in Sweden. Hence, these are the strategies chosen to analyse in this thesis. The definitions as follow are extracted from Barclay Hedge (2015b-d) in combination with previous literature (Frydenberg, Lindset & Weestgaard S. 2008).

<b>Strategy</b>	<b>Main characteristics</b>
CTA/Managed Futures	CTA/Managed Futures can be divided into the category “systematic traders” and “discretionary traders”, where the first uses mathematical methods while investigating past prices to forecast future prices to make trading profits. Discretionary traders rely on their own knowledge and trading awareness rather than on quantitative methods. Overall, the main characteristic for the strategy is the investing in future contracts and listed commodities.
Equity Hedge	The main feature of Equity Hedge is, as the name implies, long and short positions in the equity market that constantly are being hedged. Short selling is commonly used, and both stocks and stock index options are targets.



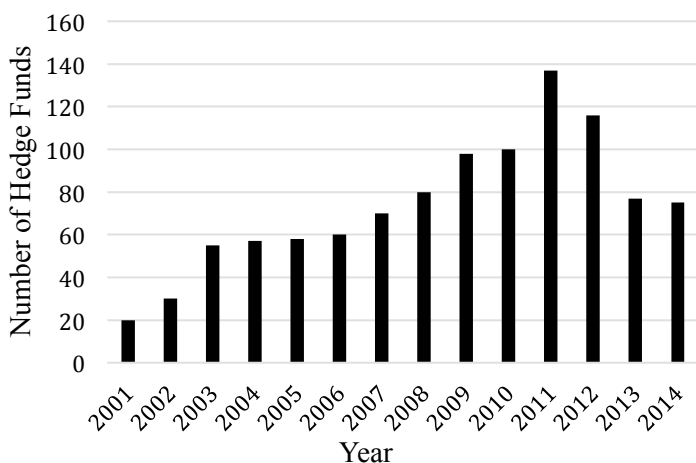
**Macro** Funds applying Macro concentrates on the global economic policies’ and global capital flows’ affect on prices. By investigating these changes, their investments are allocated between different mechanisms to generate consistent trading profits.

**Multi-Strategy** Funds using Multi-Strategy distribute capital between numerous different investment strategies. Thereby, Multi-Strategy is applying more than one strategy when allocating the investments and has the ability to change the distribution between them when the market situation changes.

### 2.3 Performance Hypothesis

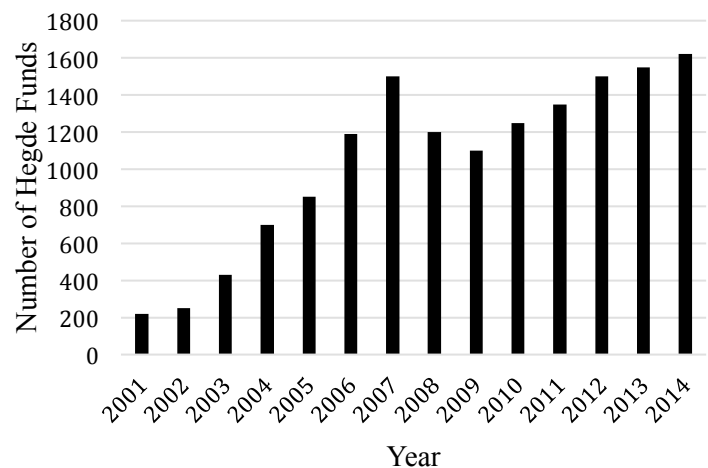
For the result of this thesis, there are different possible outcomes that will be introduced in the following section. One possible outcome is that European hedge funds will outperform the Swedish due to a longer active market, with both more assets under management and a larger number of hedge funds. According to figure 1, the number of hedge funds in Sweden increased until 2011. After, the size of the industry started to decrease, and in 2014, the number of Swedish hedge fund was almost 80. In Europe, the industry grew until 2007, as shown in figure 2. During the period of 2008 to 2009, a temporary decrease in number of funds is shown, before the number increased once again. In 2014, the total number of fund in the European hedge fund industry was around 1600, compared to 80 in Sweden. Moreover, the number of funds has increased in the recent years in Europe, while the industry has experienced a decrease in Sweden.

**Figure 1: Growth in the Swedish Hedge Fund Industry**



Source: Söderberg & Partners (2015).

**Figure 2: Growth in the European Hedge Fund Industry**



Source: J.P. Morgan (2015).

Moreover, one can assume that geographic location might affect the amount invested in hedge funds, and thereby also the return. The European business centre, with around 70 % of the European Union wealth, lies in the geographic area 700 km from Luxembourg (PwC, 2015). This indicates that the European hedge funds may have more capital and might attract the leading hedge fund managers. These two facts combined imply opportunities to outperform the Swedish industry. One reason for Swedish hedge funds to outperform European hedge funds might be the situation and separation of the Swedish financial market. Sweden has their own currency and interest rate and might therefore be less affected from macroeconomic disturbances that distress the Euro and the European hedge funds. These two factors may give the Swedish hedge funds an opportunity to perform and invest differently from the European hedge funds that might generate higher return.

Furthermore, it is reasonable to assume that the fee structure of the fund should be reflected in the performance of the fund. To motivate high fees, the fund needs a high return to attract investors. The region with highest fees should therefore also have the highest return. Since the European hedge funds may have more capital and attract leading managers, one can assume their fees to be higher.

Another hypothesis is that the most popular strategy should be the best performing one. The strategy dominating the hedge fund market in both Sweden and Europe is long-short Equity Hedge (Strömqvist, 2009 and European Central Bank, 2005).

### **3. Problem Statement**

The main target of this thesis is to investigate whether the Swedish hedge funds outperform the European hedge funds. We also want to conclude which hedge fund investment strategy that generates the highest return in Sweden and Europe, and whether the included strategies differ in performance between the regions.

Furthermore, we want to analyse why one region outperforms the other. To make this comparison possible, this thesis will examine different characteristics for the Swedish and European hedge funds and investigate which characteristics that affect the performance.

For this thesis, the main null hypothesis is:

**H<sub>0</sub>: Swedish hedge funds outperform European hedge funds.**

**H<sub>1</sub>: Swedish hedge funds do not outperform European hedge funds.**

## **4. Literature Review**

In the following section, previous literature relevant for the analysis in this thesis will be presented.

### **4.1 Hedge Fund Strategy Performance**

Hedge fund performance has long been investigated. One article of high relevance on the subject is “Risk and returns of hedge funds investment strategies” by Boasson and Boasson (2011). They compare twelve different hedge fund strategies by using established risk and return measurements. Other characteristics included for analysis are fees and correlations between different investment strategies and the market. Boasson and Boasson (2011) found evidence for positive abnormal return for all strategies. Furthermore, they established that the fees of the strategies did not correspond to the return. Boasson and Boasson (2011) found the strategy Distressed Securities to have the highest Sharpe ratio and therefore the highest reward-to-risk. The article concludes that all strategies outperform the market on a risk-adjusted basis during the time period 1990 to 2005, while still following the market.

Frydenberg, Lindset and Weestgaard (2008) also use the Sharpe ratio measurement when comparing the performance of different hedge fund performance. The strategy with highest Sharpe ratio in their study was Equity Market Neutral, while negative Sharpe ratio was found for the investment strategy Dedicated Short.

### **4.2 Hedge Fund Characteristics**

Hedge funds differ from mutual funds in their characteristics, which make these factors commonly analysed when examine hedge fund performance. Ackermann, McEnally and Ravenscraft (1999) investigate how different characteristics affect the performance. They state that the risk level of hedge funds tends to be higher than in other funds due to the opportunity to invest in other types of assets. They also examine the difference in fee structure between hedge funds and mutual funds and state that performance fee should increase the

return of the fund. Ackermann, McEnally and Ravenscraft's (1999) conclude that the performance fee has a very small effect on the return. They measured this by running one regression on the Sharpe Ratio and one on the return volatility with the performance fee as one of the independent variables.

Moigne and Savaria (2006) investigate in their article the significance effect of hedge fund characteristics on the return. The chosen variables for their article are, among others, investment style, age, size, management fee, incentive fee and volatility. A cross-sectional dummy-variable regression has been done for the estimations of the effect for the characteristics. Moigne and Savaria (2006) found that risk, investment style and management fee have a significant effect on the return.

## **5. Methodology and Data Sample**

### **5.1 Methodology**

According to Alternative Investment Management Association (2014), one way of measuring hedge fund performance is to compare them by strategies, since the investment style among them differ enormously. If comparing hedge funds as an asset class, the return might be cancelled out since one strategy might increase the return in the period, while another performs badly. By separating the hedge funds on strategy basis, it becomes possible to compare their performance with a more accurate result (Alternative Investment Management Association, 2014). To take this effect into account, the funds will be separated by strategy when presenting one of the comparisons between the Swedish and European hedge funds.

To compare the performance of the Swedish and European hedge funds, the average return, standard deviation and the Sharpe ratio will be measured and analysed, as commonly done by previous researchers (Boasson & Boasson, 2011). Monthly data will be used since it gives a more accurate result than the yearly data. This also makes it possible to include funds that were active less than a year (Ackermann, McEnally & Ravenscraft 1999).

Furthermore, as previously done by Boasson and Boasson (2011), this thesis will investigate which hedge fund investment strategy that generates the highest return. Instead of using the four-factor model used by Boasson and Boasson, an OLS regression will be conducted with

the return of the funds as the dependent variable. This will enable the study of how the strategies and other characteristics are affecting the hedge funds performance. The OLS regression will measure which characteristic that has the negative and positive effect on the return of the funds. From this model, this thesis will analyse why Swedish hedge funds under- or outperform the European hedge funds by comparing characteristics between the two regions. The model will be described in detail further on.

The return per month of the funds has been calculated from the monthly price of the fund, as below:

$$r_t = \frac{P_t}{P_{t-1}} - 1, \quad (1)$$

where  $P_t$  represents the price of the fund at time period  $t$ , while  $P_{t-1}$  is the price of the fund at one time period back from  $t$ .

The risk-free rate of return has been calculated from the monthly price of the 3-month Treasury bill as following:

$$r_f = \left( \frac{P_t}{12} \right) / 100, \quad (2)$$

where  $P_t$  is the price of the 3-month Treasury bill at time period  $t$ .

To measure the average monthly return per fund and the average risk-free rate for the given time period, the arithmetical mean is calculated as below:

$$\bar{r} = \frac{\sum r_t}{n}, \quad (3)$$

where  $r_t$  shows the return at time period  $t$  and  $n$  is the number of months included.

The standard deviation measures the dispersion around the mean and is therefore a measurement of the risk (DeFusco, McLeavey, Pinto, Runkle & Andson, 2015, s 115). The following formula is used:

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (r_i - \bar{r})^2}{n-1}}, \quad (4)$$

where  $r_i$  shows the monthly return of fund  $i$  at a given time period and  $\bar{r}$  denotes the average monthly return of fund  $i$  and  $n$  presents the number of months.

The Sharpe ratio is a measurement of the risk-return relationship. It calculates the excess return in relation to the level of risk. A high Sharpe ratio is preferable, since it indicates high return with a low amount of risk (DeFusco, McLeavey, Pinto, Runkle & Andson, 2015, s 125). The formula used is described below:

$$SR = \frac{\bar{R}_i - \bar{R}_f}{\sigma_i}, \quad (5)$$

where  $\bar{R}_i$  denotes the average monthly return of strategy  $i$ ,  $\bar{R}_f$  shows the average monthly risk-free rate and  $\sigma_i$  states the average monthly standard deviation of strategy  $i$ .

To investigate how the chosen characteristics are correlated and to check for autocorrelation, a correlation matrix will be conducted between them. The correlation between two variables is calculated using the following formula:

$$\rho_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}}, \quad (6)$$

Where  $x_i$  is the value for characteristic  $x$  for fund  $i$ ,  $y_i$  shows the value for characteristic  $y$  for fund  $i$ ,  $\bar{x}$  denotes the average value for characteristic  $x$ ,  $\bar{y}$  presents the average value for characteristic  $y$  and  $n$  is the total value of months.

## 5.2 Data Sample

Monthly prices of the Swedish and the European hedge funds from January 2004 to January 2015 have been collected from the Bloomberg database. In this sample, there are European hedge funds and 60 Swedish hedge funds, which includes both active and non-active hedge funds. A list of the included European countries can be found in Table A1 in appendix. The dataset includes the bear market of the financial crisis of 2008, which can affect the results. An additional analysis will be conducted to measure the potential effect.

To select which data to collect about the funds, the article by Boasson and Boasson (2011) has been the benchmark. Boasson and Boasson (2011) extracted monthly return observations.

In order to calculate the monthly return accordingly to their method, the monthly prices of the funds have been collected instead. The monthly price represents the last price provided by the stock exchange. The return of each strategy is based on the average return of the underlying hedge funds using the strategy. Additionally, information about the current management fee and incentive fee has been extracted. Historical information on fees is not available, and it is therefore assumed to be constant over time, similarly done by Moigne and Savaria (2006).

From the Datastream database, the 3-months Treasury bill for both the Swedish National Debt Office and the European Central Bank were downloaded, which represent the risk-free rate of return. This information will be required for the calculations of Sharpe ratios.

### **5.3 Possible Bias**

Bias is an important part of hedge funds studies and for the strength of the results in this thesis. Fung and Hsieh (2000) are addressing the problems with bias when collecting hedge fund data that will be presented further on.

#### **5.3.1 Survivorship Bias**

Survivorship bias references the problem that many hedge fund databases consist of only actively operating funds. Fung and Hsieh (2000) indicate that the reason for defunct of hedge funds often depends on poor performance. When these funds are removed from the database, the remaining information is upward bias since it only represents the performance of successful hedge funds. In this thesis, both active and non-active hedge funds have been included to minimise this problem.

#### **5.3.2 Selection Bias**

Selection bias is a second problem when investigating hedge funds. Due to weak regulations of hedge funds, their managers have to approve public information. Fung and Hsieh (2000) predict that some hedge fund managers only report to the database if the fund performs well, while other choose not to report their good performance. Selection bias should therefore only have a partial biased effect on hedge fund databases and no further investigation will be conducted in this thesis.

### 5.3.3 Multi-Period Bias

Multi-period bias relates to the requirement of historical information of the fund. This bias occurs if the objects included in the sample do not have enough observations to make the analysis possible. The number of historical facts required depends on the time frame of the sample (Fung & Hsieh, 2000). In order to avoid problems with multi-period bias, the sample analysed in this paper disregard all funds with five or less historical observations of return.

### 5.3.4 Reliability and Validity

The reliability of this thesis depends mainly on the data extraction. Secondly, the validity refers to whether the study measures the stated research question. Both active and non-active hedge funds have been included to avoid problems with bias and thereby increase the reliability. Moreover, the variables have been chosen accordingly to past literature. Since the characteristics are well established in previous analysis, one can assume them to be accurate measurements of hedge fund performance. The main different in this thesis in comparison to past literature is the Swedish dummy variable included in the regression. The use of dummy variables is a well-established tool in econometric analysis (Moigne & Savaria, 2006) and should therefore be a valid estimation in this thesis. The Swedish dummy variable enables an opportunity to examine whether the Swedish hedge funds outperform the European ones. This investigation approach differs this thesis from previous literature. Finally, since this thesis has accounted for the factors generating high reliability and validity, the result should be reliable.

## 5.4 Descriptive Statistics

First, the risk-free rate has been calculated for both Sweden and Europe. The result of the average monthly return is reported in table 1. The risk-free rate is slightly smaller in Sweden in comparison to Europe.

**Table 1: Average risk-free rate of Return**

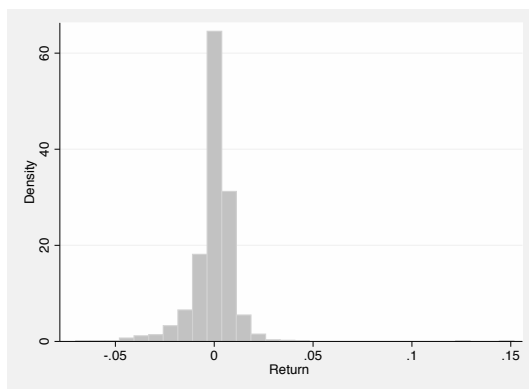
	Sweden	Europe
	(%)	(%)
Risk-Free Rate (Monthly)	0.14	0.16

Table 1 shows the monthly return on the 3-month Treasury bill for both the Swedish National Debt Office and the European Central Bank.

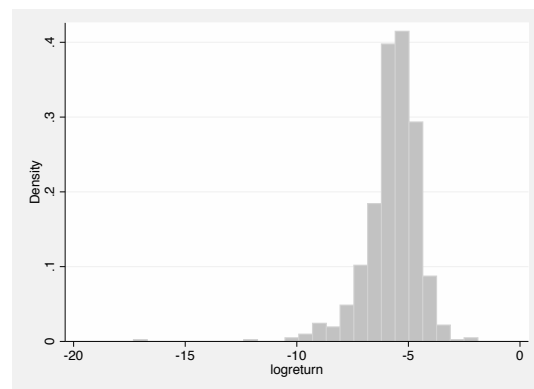


In order to estimate consistent coefficient in the OLS regression, the variables should be normally distributed. This can be obtained by using logarithmical values (Wooldridge, 2015, s 96). In the sample, risk and return are not normally distributed. Return has a slightly negatively skewed distribution, while risk is positively skewed. To improve the estimations, logarithmic values have been generated and further used in the regressions. Figure 3 and 5 present the distribution of the variables return and risk while figure 4 and 6 shows the distribution of the logarithmic values for the variables.

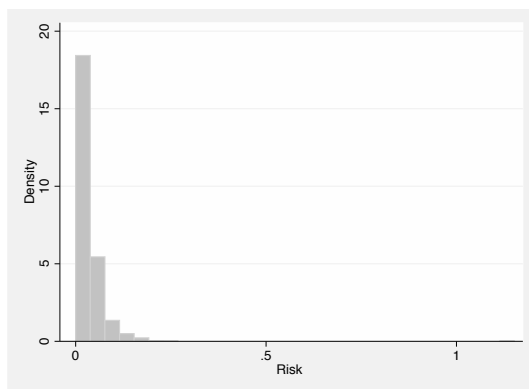
**Figure 3: The distribution of Return**



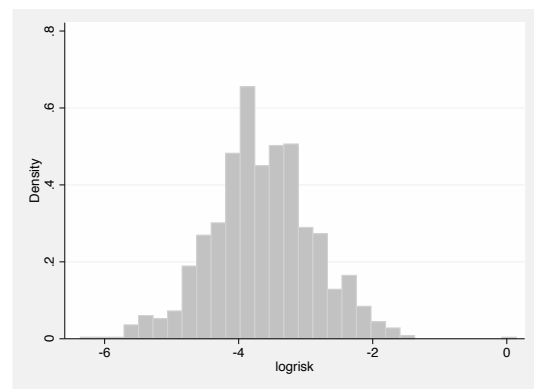
**Figure 4: The distribution of Log Return**



**Figure 5: The distribution of Risk**

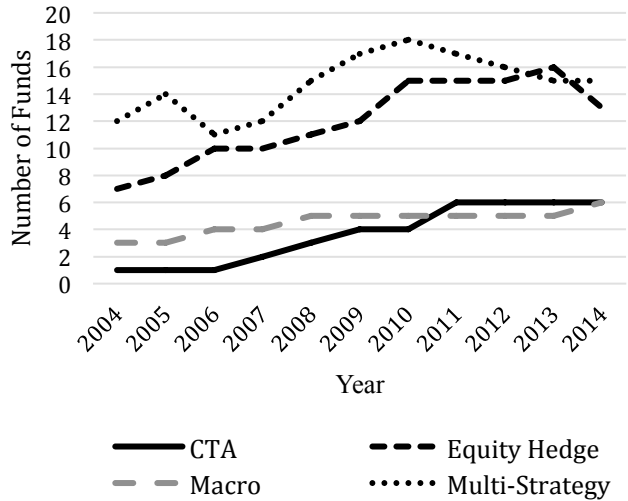


**Figure 6: The distribution of Log Risk**



The number of hedge funds per investment strategy in the sample has changed over the given time period in both Sweden and Europe since both active and non-active hedge funds are included and hedge fund managers have no obligation to report to the database. In figure 7, the number of hedge funds per strategy in Sweden in the sample is illustrated. The most commonly used strategy in all the years, except 2013, is Multi-Strategy. This differs from the finding reported by Strömquist (2009), who states Equity Hedge to be the most popular one. Furthermore, the overall number of hedge funds has increased from 2004 to 2014, which indicate a growth in the industry. The number of funds per strategy in the sample in Europe from 2004 to 2014 is shown in figure 8. This number increased for all strategies until 2009, where all decreased until 2014. Similarly to Sweden, the total number of hedge funds in Europe has increased from 2004 to 2014.

**Figure 7: Number of Hedge Funds per Strategy in Sweden, 2004-2014**



**Figure 8: Number of Hedge Funds per Strategy in Europe, 2004-2014**

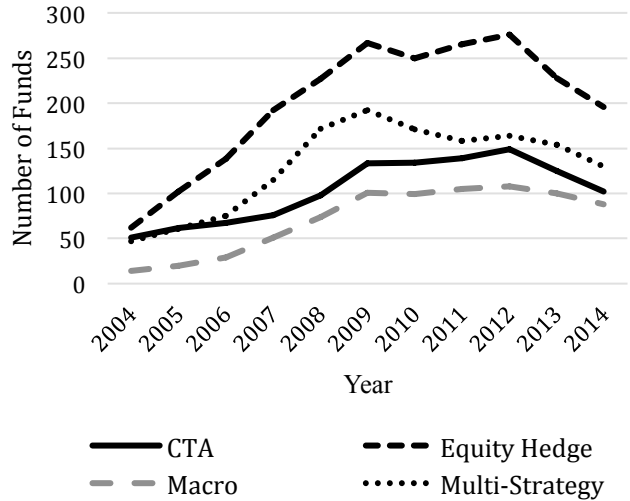


Table 2 shows the total number of hedge funds per strategy during the time period, including both active and non-active funds. Overall, Equity Hedge is the most common strategy in Europe and Multi-Strategy is most common in Sweden. The least used strategy in Europe is Macro and in Sweden, both Macro and CTA/Managed Futures.

**Table 2: Total number of Hedge Funds per Strategy**

	Sweden	Proportions in Sweden (%)	Europe	Proportions in Europe (%)
CTA/Managed Futures	6	10	209	19
Equity Hedge	19	32	437	40
Macro	6	10	163	15
Multi-Strategy	29	48	288	26
<b>Total</b>	<b>60</b>	<b>100</b>	<b>1097</b>	<b>100</b>

Table 2 provides information about the total number of hedge funds per strategy in the sample.

The summary statistics for Sweden and Europe are presented in table 3. The return and risk are measured in monthly data and the strategies are dummy variables. The dummy variable with the highest mean in Sweden, Multi-Strategy, is the most used strategy for the Swedish hedge funds. The strategy with the highest mean for Europe is Equity Hedge, indicating the most commonly used strategy among the European hedge funds. Furthermore, the average monthly return for the Swedish hedge funds is 0.3 % and the average monthly risk is 2.1 %, while the average monthly return for all hedge funds in Europe is -0.02 % and the average monthly risk is 3.6 %. The return is therefore lower in Europe than in Sweden, when the risk at the same time is higher.

The average management fee for the hedge funds in Sweden is 1.05 %, which shows a lower level than the average of 1.25 % that Ackermann, McEnally and Ravenscraft (1999) reported in their study. Swedish hedge funds have an average performance fee of 12.53 %. This is also smaller than the findings by Ackermann, McEnally and Ravenscraft (1999), who reported a performance fee of 13.87 %. In Europe, the average management fee is 1.41 % and performance fee is 14.14 %. The funds in Europe are therefore more expensive than in

Sweden. This is also closer to the values reported by Ackermann, McEnally and Ravenscraft (1999).

Furthermore, Ackermann, McEnally and Ravenscraft (1999) reported the average age of a hedge fund to be approximately 5 years. This is lower than the average age in Sweden, which is 8.350 years. The hedge funds in Europe are also younger than in Sweden, with an average age of 7.198 years. This is still higher than the findings by Ackermann, McEnally and Ravenscraft (1999).

**Table 3: Summary Statistics Sweden and Europe separately**

	Obs.	Mean	Std. Dev.	Min	Max
<i>Swedish Hedge Funds</i>					
CTA/Managed Futures	60	0.1	0.303	0	1
Equity Hedge	60	0.317	0.469	0	1
Macro	60	0.1	0.303	0	1
Multi-Strategy	60	0.483	0.504	0	1
Return (Monthly)	60	0.003	0.004	-0.017	0.011
Risk (Monthly)	60	0.021	0.014	0.003	0.081
Management Fee (%)	60	1.054	0.658	0	3.1
Performance Fee (%)	53	12.530	8.647	0	20
Age (Years)	60	8.350	4.120	2	19
<i>European Hedge Funds</i>					
CTA/Managed Futures	1097	0.191	0.393	0	1
Equity Hedge	1097	0.400	0.490	0	1
Macro	1097	0.149	0.356	0	1
Multi-Strategy	1097	0.263	0.446	0	1
Return (Monthly)	1097	-0.0002	0.012	-0.070	0.152
Risk (Monthly)	1097	0.036	0.045	0	1.152
Management Fee (%)	1054	1.410	0.876	0	7
Performance Fee (%)	1050	14.140	9.011	0	50
Age (Years)	1095	7.198	3.809	1	26

Table 3 displays summary statistics for the Swedish and European hedge funds separately. CTA/Managed Futures, Equity Hedge, Macro and Multi-Strategy are dummy variables.

Finally, the summary statistics for Europe and Sweden combined are listed in table 4. These are the values used in the regressions further on. Here the Swedish dummy variable is included as well. The average monthly return for all hedge funds in the sample is -0.02 % and the average monthly risk is 3.5 %.

**Table 4: Summary Statistics Europe and Sweden combined**

	Obs.	Mean	Std. Dev.	Min	Max
Swedish	1157	0.052	0.221	0	1
CTA/Managed Futures	1157	0.186	0.389	0	1
Equity Hedge	1157	0.394	0.489	0	1
Macro	1157	0.146	0.353	0	1
Multi-Strategy	1157	0.274	0.446	0	1
Return (Monthly)	1157	-0.0002	0.012	-0.070	0.152
Risk (Monthly)	1157	0.035	0.044	0	1.152
Management Fee (%)	1114	1.390	0.869	0	7
Performance Fee (%)	1103	14.068	8.996	0	50
Age (Years)	1155	7.258	3.832	1	26

Table 4 presents summary statistics for the Swedish and European hedge fund combined. CTA/Managed Futures, Equity Hedge, Macro and Multi-Strategy are dummy variables.

## 6. Empirical Results

In the following section, the empirical results will be presented combined with comments and analysis. First, correlation matrices are illustrated followed by the result for the risk, return and Sharpe ratio calculations. Finally, the difference in mean for the characteristic for Sweden and Europe and the conducted regressions will be listed.

### 6.1 Correlation

To investigate if the regression variables are correlated to each other, a test for correlation has been conducted. If none of the variables are highly correlated, no significant problem with multicollinearity will be present in the regression models (Wooldridge, 2015, s 72). Table 5 shows the result of the correlation test for the regression variables, which indicates that no variables are highly correlated. The highest correlation can be found between management fee and performance fee. The correlation between the fees and the return are slightly positive, implying that higher fee is related to higher return. Between return and risk a positive correlation can be found, indicating that the return increases when the risk does.

**Table 5: Correlation Matrix all Characteristics**

	Swedish	CTA	Equity	Macro	Multi	Mgm Fee	Prm Fee	Age	Log Return	Log Risk
Swedish	1.00									
CTA	-0.069	1.00								
Equity	-0.043	-0.402	1.00							
Macro	-0.020	-0.200	-0.335	1.00						
Multi	0.126	-0.291	-0.489	-0.242	1.00					
Mgm Fee	-0.134	0.154	0.058	-0.007	-0.197	1.00				
Prm Fee	-0.029	0.120	0.184	0.029	-0.337	0.376	1.00			
Age	0.089	0.168	-0.041	-0.061	-0.056	-0.033	0.014	1.00		
Log Return	0.033	0.020	0.110	-0.046	-0.104	0.150	0.121	-0.138	1.00	
Log Risk	-0.150	0.265	0.088	0.020	-0.320	0.192	0.172	0.117	0.335	1.00

Table 5 shows the correlation between all included variables.

Additionally, a test for correlation between the return for the different strategies was conducted. Table 6 shows that the correlation between all returns is close to zero. These findings indicate that analysing hedge funds by strategy are preferable since the returns are uncorrelated and that funds using diverse strategies perform differently.

**Table 6: Correlation Matrix between the Return of the Strategies**

	CTA Return	Equity Return	Macro Return	Multi Return
CTA Return	1.0000			
Equity Return	0.0002	1.0000		
Macro Return	-0.0006	0.0001	1.0000	
Multi Return	0.0002	-0.0001	0.0001	1.0000

Table 6 displays the correlation between the return of the strategies.

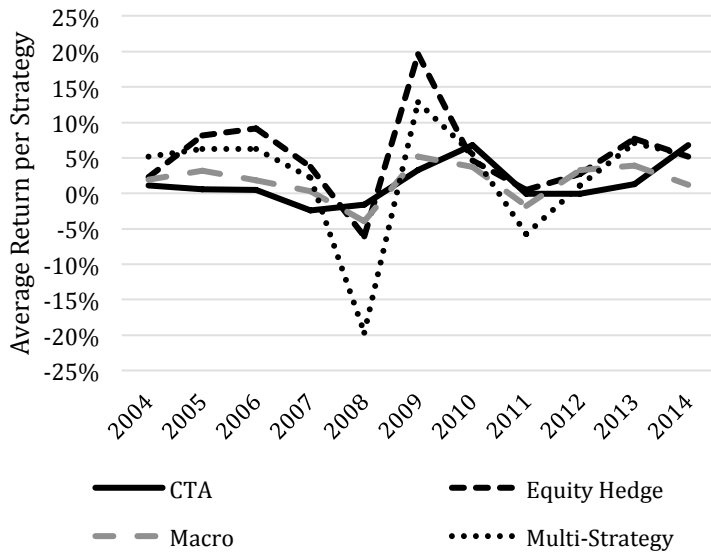
**6.2 Risk and Return**

Figure 9 illustrates the average yearly return from 2004 to 2014 in Sweden for the different investment strategies. The return of the strategies is between 0 % to 5 % in both the beginning and the end of the time period, which indicates that none of the strategies have experienced a permanent increase in return. Furthermore, the graph shows that Equity Hedge and Multi-Strategy are the strategies with the highly unstable return. Both of these strategies experienced a large decline in return during the financial crisis of 2008. Equity Hedge and Multi-Strategy also tend to perform equally. On the contrary, the return of CTA/Managed Futures and Macro did not decrease as much during the financial crisis, which indicates that they are hedged from the market. Finally, all of the strategies tend to perform similarly during the time frame, with the exception from CTA/Managed Futures in 2013.

The yearly average return from 2004 to 2014 per strategy of the European hedge funds is illustrated in figure 10. The funds in Europe experience both far higher and far lower returns than the funds in Sweden, with a highest average return of 200 % and the lowest average return of -400 %. The returns for the strategies in both 2004 and 2014 are also between 0 % and 100 %, which shows that the returns have not increased permanently over time. The only exception is CTA/Managed Futures, which return in 2014 is over 100 %. Furthermore, Equity Hedge is the strategy with the most unstable return in Europe, and is the strategy affected the most by the financial crisis of 2008. CTA/Managed Futures is the only strategy with a positive return during 2008, even though it also experiences a large decrease in return after

the year of 2008. Finally, Macro and Multi-Strategy tend to perform simultaneously during the time frame, and are also the strategies with the most stable return.

**Figure 9: Yearly Average Return for Sweden per Strategy, 2004-2014**



**Figure 10: Average Return for Europe per Strategy, 2004-2014**

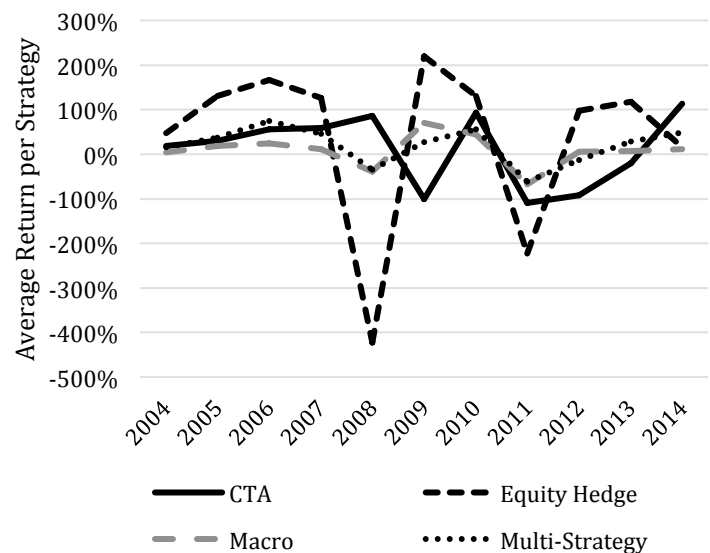


Table 7 shows the calculated average standard deviation for the strategies over the time period 2004 to 2014. Overall, the strategies in Sweden are less risky than in Europe. CTA/Managed Futures has the highest risk in both Sweden and Europe, while Macro presents the lowest risk in both regions. These findings contradict the work by Meligkotsidou, Vrontos and Vrontos (2009) and Frydenberg, Lindset and Weestgaard (2008) since the standard deviations in table 7 are slightly higher than their findings. Their presented standard deviations are 0.22 % for CTA/Managed Futures, 2.59 % for Equity Hedge, 2.50 % for Macro and 0.90 % for Multi-Strategy.

**Table 7: Monthly Standard Deviation per Strategy**

	Sweden (%)	Europe (%)
CTA/Managed Futures	3.53	4.49
Equity Hedge	2.30	3.78
Macro	1.72	3.01
Multi-Strategy	1.73	3.05

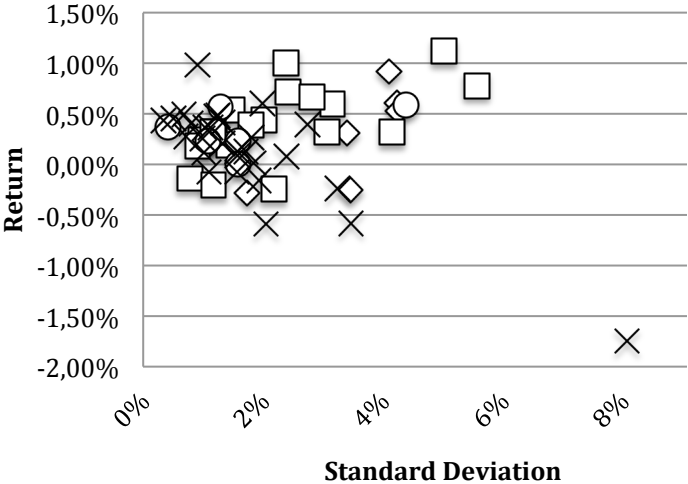
Table 7 presents the average standard deviation for the strategies over the time period. The data is measured on a monthly basis.



Figure 11 illustrates the relationship between a Swedish hedge fund’s standard deviation and its average monthly return, sorted by strategy. When looking at the figure, it is shown that Swedish hedge funds overall have low standard deviations, indicating low risk. Multi-Strategy, presents an outlier value that differs significantly from the other observations. It shows higher standard deviation and lower return than the other funds in the sample. The highest standard deviation and return can be found for Equity Hedge. The funds with lowest return and standard deviation are represented by Multi-Strategy. In general, a slightly positive linear relationship can be detected between risk and return.

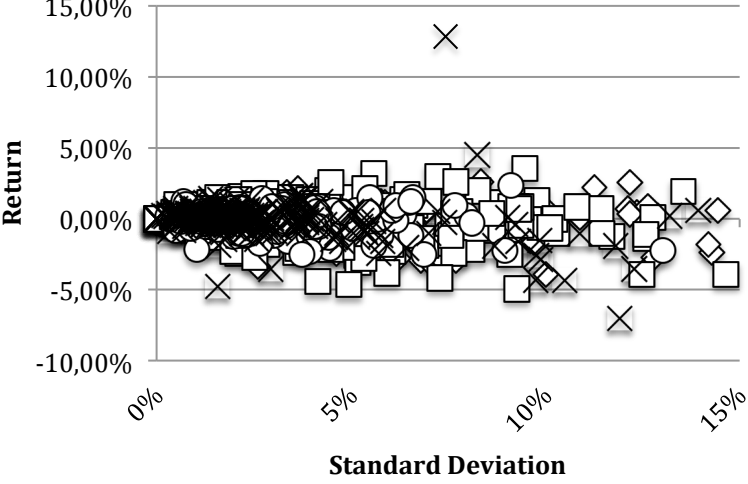
The relationship between standard deviation and return for European hedge funds sorted by strategy is presented in figure 12. Multi-Strategy presents one outlier with higher return than other funds. In general, the investment strategy with the highest risk is Equity Hedge. The same strategy also presents some of the highest returns in Europe. Overall, the European hedge fund market generates greater return and higher risk compared to the Swedish market, indicated by looking at the different scale of the figures.

**Figure 11: Monthly Risk-Return per Swedish Hedge Fund**



◇ CTA   □ Equity Hedge   ○ Macro   × Multi-Strategy

**Figure 12: Monthly Risk-Return per European Hedge Fund**



◇ CTA   □ Equity Hedge   ○ Macro   × Multi-Strategy

### 6.3 Sharpe Ratio

The Sharpe ratio presents the relationship between risk and return. It is preferable to invest in funds with high Sharpe ratio, since it implies higher return in relation to the risk taken. In table 8, the Swedish hedge funds sorted by strategy present higher Sharpe ratio than the European ones. This indicates that hedge funds in Sweden perform superior in relation to the units of risk in comparison to hedge funds in Europe. It is therefore preferable to invest in Sweden, when looking at the Sharpe ratio for the different strategies. This follows the data presented in the summary statistics, where the Swedish hedge funds were found to have higher return and lower risk than the European hedge funds.

In contrast to the findings presented in table 8, Boasson and Boasson (2011) calculated the Sharpe ratio per year rather than an average over the time period. However, they reported some of the yearly Sharpe ratios to be negative, similar to the findings for the strategies in Europe presented in table 8. Frydenberg, Lindset and Weestgaard (2008) also report the monthly Sharpe ratio for different strategies in their study. During their time period 1994 to 2005, they present a monthly average of 0.07 for CTA/Managed Futures, 0.21 for Equity Hedge, 0.24 for Macro and 0.29 for Multi-Strategy. Table 8 shows that the Sharpe ratio for CTA/Managed Futures in Sweden is similar to their findings. Nevertheless, the other results in table 8 differ significant, especially for Europe.

**Table 8: Monthly Sharpe Ratio per Strategy**

	Sweden	Europe
CTA/Managed Futures	0.05	-0.05
Equity Hedge	0.11	-0.04
Macro	0.11	-0.07
Multi-Strategy	0.00	-0.05

Table 8 shows the Sharpe ratio for the strategies. The data is measured on a monthly basis.

## 6.4 Difference in Mean between Hedge Fund Characteristics in Sweden and Europe

An independent means t-test have been completed in order to estimate whether the differences between two groups are statistically significant (Pandis, 2015). The results for the differences in Sweden and Europe are illustrated in table 9. The difference in return is statistically significant at a 10 % level, which indicates higher return in Sweden than in Europe. The difference in mean for the performance fee is not statistically significant, while it is for risk, management fee and age. The findings indicate that the hedge funds in Sweden have lower risk, lower management fee, are older and generate a higher return in comparison to the hedge funds in Europe. Here, evidence has been found for Swedish hedge funds to outperform the European ones.

**Table 9: Difference in mean between the Characteristics for Sweden and Europe**

	Sweden	Europe	Difference
Return (%)	0.26 (0.06)	-0.02 (0.04)	0.28 * (0.15)
Risk (%)	2.10 (0.19)	3.60 (0.14)	-1.52 ** (0.59)
Management Fee (%)	1.05 (0.08)	1.41 (0.03)	-0.36 *** (0.11)
Performance Fee (%)	12.53 (1.19)	14.15 (0.28)	-1.62 (1.27)
Age	8.35 (0.53)	7.20 (0.12)	1.15 ** (0.51)

Table 9 provides the result for the two-sample t-tests. The values represent the mean for each variable in Sweden and Europe during the time period. The difference in mean is tested for significance. Standard errors are presented in the parenthesis.

\* = 10 % significance level, \*\* = 5 % significance level, \*\*\* = 1 % significance level

## 6.5 Difference in Return per Strategy

In order estimate the impact on the return of the different investment strategies interaction terms between the strategies and the return have been created. Further on, an independence means t-test were conducted to investigate if the differences in return for the strategies in Sweden and Europe are statistically significant. The result is listed in table 10, where it can be concluded that the differences in the return per strategy between Sweden and Europe are not statistically significant. In conclusion, no evidence has been found for the superior performance for the investment strategies in Sweden.

**Table 10: Difference in mean Return per Strategy for Sweden and Europe**

	Return Sweden (%)	Return Europe (%)	Difference (%)
CTA/Managed Futures	0.031 (0.02)	-0.016 (0.01)	0.015 (0.06)
Equity Hedge	0.126 (0.04)	-0.001 (0.02)	0.125 (0.09)
Macro	0.033 (0.02)	-0.008 (0.01)	0.025 (0.04)
Multi-Strategy	0.066 (0.04)	0.002 (0.02)	0.064 (0.10)

Table 10 lists the result for the two-sample t-tests. The values represent the mean return for the strategies in Sweden and Europe during the time period. The difference in mean is tested for significance. Standard errors are presented in the parenthesis.

\* = 10 % significance level, \*\* = 5 % significance level, \*\*\* = 1 % significance level

## 6.6 Characteristics Effect on Performance

In order to determine how different characteristics affect the performance of hedge funds, multiple regression analysis will be used. This is a well-established tool for conducting economic analysis among previous authors like Fung and Hsieh (2002) and Moigne and Savaria (2006). Fung and Hsieh (2002) use different types of multiple regressions in order to analyse the risk of fixed-income hedge funds. Moigne and Savaria (2006) conduct regressions based on cross-sectional dummy variables. Multiple regression analysis creates opportunities to control for the effect of different factors on the dependent variable at the same time (Wooldridge, 2015, s 56). The following equation will be used to estimate the multifactor model in this thesis:

$$r_{it} = \alpha + \beta_1 Sgy1 + \beta_2 Sgy2 + \beta_3 Sgy3 + \beta_4 Sgy4 + \beta_5 (PrmFee_i) + \beta_6 (MgmFee_i) + \beta_7 Risk_i + \beta_8 Age_i + \gamma (Swedish) + \varepsilon_{it}, \quad (7)$$

where  $r_{it}$  denotes the monthly return of fund  $i$  at time  $t$ ,  $\alpha$  is a constant,  $Sgy1$  is a dummy variable for CTA/Managed Futures that takes the values 1 if the fund uses CTA/Managed Futures,  $Sgy2$  is a dummy variable for Equity Hedge, having the value 1 if the fund operates using Equity Hedge,  $Sgy3$  is a dummy variable for Macro that takes the value 1 if the fund uses Macro and  $Sgy4$  is a dummy variable for Multi-Strategy, takes the value of 1 if the fund operates with Multi-Strategy.  $PrmFee_i$  denotes the performance fee for fund  $i$  and  $MgmFee_i$  shows the management fee for fund  $i$ .  $Risk_i$  indicated the monthly standard deviation for fund  $i$  and  $Age_i$  presents the age of fund  $i$ .  $Swedish$  is a dummy variable for Sweden that takes the value of 1 if the fund is Swedish and 0 if the fund is European and  $\varepsilon_{it}$  is the error term.

The variables for the regression model have been chosen according to Moigne and Savaria's (2006) study on hedge fund characteristics. The variables that will be used in the OLS regression are a sample from their chosen ones, as following: hedge fund investment strategy, fund age, management fee, performance fee and risk. Furthermore, a Swedish dummy has been added. The Swedish dummy will be of high relevance for the analysis and is an important tool to investigate the main target of this thesis, since it will indicate whether the Swedish hedge funds outperform the European hedge funds.

As done in previous work, one of the dummy variables is omitted as base group to eliminate problems with multicollinearity (Ackermann, McEnally & Ravenscraft, 1999). The base group in this thesis will be Equity Hedge, the most commonly used strategy in Sweden (Strömquist, 2009). This enables the comparison between Equity Hedge and the other strategies. The management fee is defined in the Bloomberg database as “the current base management fee that the management company charges annually for its services” and the performance fee is defined as “percentage fee (net assets) that the management company charges for exceeding an established performance benchmark”.

The result for this multifactor model is shown in table 11. The logarithmic value of return is the dependent variable, while the other variables are independent. Equity Hedge is used as the base group.

As illustrated in table 11, the variables Swedish, CTA/Managed Futures, Macro, management fee, age and log risk are statistically significant, at different levels. The coefficient for the Swedish dummy indicates that the null hypothesis cannot be rejected and that the Swedish hedge funds outperform European hedge funds. This follows the finding in previous calculations of the mean return of the Swedish hedge funds being statistically significant higher than for the European hedge funds.

All strategies have negative coefficients in relation to the base group Equity hedge, which indicate that Equity Hedge is the best performing investment strategy. However, the estimations for CTA/Managed Futures and Macro are only significant at a 10 % level and for Multi-Strategy no significant effect can be found.

According to Ackermann, McEnally and Ravenscraft’s (1999) findings, performance fee consistently affects the return of hedge funds in their sample. The regression made in this paper contradicts these findings, since the coefficient for performance fee is not statistically significant. The statistically significant coefficient for management fee also opposes the findings of McEnally and Ravenscraft (1999), who reported weak evidence for the opposite. Boasson and Boasson (2011) concluded that no evidence could be found.

Furthermore, the characteristic age and risk also have a significant effect on performance of the hedge funds. We have found evidence for a negative effect for age on the return. Risk on

the other hand, has a highly positive significant effect on the performance. Riskier funds therefore tend to generate a higher return while longer active funds should generate lower return.

From the OLS regression, it can be concluded how the examined characteristics affect the performance of the hedge funds. In this sample, Swedish hedge funds are found to be less risky, have lower management fee and have been active longer than European hedge funds. These facts, combined with the findings from the OLS regression, indicate that Swedish hedge funds should generate lower return. This contradicts the statistically significant higher return in Sweden and the positive significant effect of the Swedish dummy variable. Therefore, this research cannot state why the Swedish market perform superior. In order to examine why Swedish hedge outperform European hedge funds other characteristics should be investigated.

In conclusion, the OLS regression gives evidence for Swedish hedge funds to outperform European hedge funds due to the statistically significant value of the Swedish dummy variable. Evidence has also been found for Equity Hedge to outperform CTA/Managed Futures and Macro and the characteristics effect on the return is measured as well.

**Table 11: OLS Regression**

Log Return (Monthly)	Coefficient
Swedish	0.536 *** (0.119)
CTA/Managed Futures	-0.229 * (0.121)
Macro	-0.237 * (0.143)
Multi-Strategy	-0.061 (0.117)
Management Fee (%)	0.123 ** (0.059)
Performance Fee (%)	0.005 (0.005)
Age (Years)	-0.052 *** (0.010)
Log Risk (Monthly)	0.559 *** (0.060)
Intercept	-3.427 *** (0.265)
Obs.	632
Adj. R <sup>2</sup>	0.1706

Table 11 displays the regression result for the variables effect on hedge fund performance. The return in logarithmic form is the dependent variable, while the other variables are independent. Robust standard errors are listed in the parenthesis.

\* = 10 % significance level, \*\* = 5 % significance level, \*\*\* = 1 % significance level

## 7. Robustness

The results presented in the previous section illustrate lower values for the average return compared to previous literature. A major difference between this sample and the samples of other studies is the time frame. Boasson and Boasson (2011) use 1972 to 2005, while Ackermann, McEnally, and Ravenscraft (1999) analyse data from 1988 to 1995 and Frydenberg, Lindset and Weestgaard (2008) investigate hedge fund return from 1994 to 2005. The financial crisis of 2008 affected the global financial market and might have a negative impact on the result in this thesis.



In order to examine whether the result of this sample are stable over time, new t-tests were conducted. In table 12, a comparison between the monthly average return of the strategies in Sweden and Europe is presented. The years of 2007, 2008 and 2009 have been removed to eliminate most the effect of the crisis. In the parenthesis, the original sample result is presented to enable a comparison between the different time periods. As indicated in the table, the financial crisis has affected the return during the time period analysed. CTA/Managed Futures generated higher average return when deducting the years of 2007, 2008 and 2009 in both Sweden and Europe, and has therefore been negatively affected by the overall situation of the economy. This is true for Multi-Strategy and Equity Hedge as well. Macro was not affected in Europe, however the return increased in Sweden. The difference between the average return in Sweden and Europe is positive for all strategies, implying that Swedish hedge funds outperform European hedge funds when accounting for the financial crisis as well. However, no significant difference between the regions was found and no evidence have been found for the strategies in Sweden to perform superior.

**Table 12: Average Monthly Return 2004-2006 & 2010-2014 (and with 2004-2014)**

	Sweden (%)	Europe (%)	Difference (%)
CTA/Managed Futures	0.045 (0.031)	-0.007 (-0.016)	0.052
Equity Hedge	0.128 (0.126)	0.064 (-0.001)	0.064
Macro	0.042 (0.033)	-0.008 (-0.008)	0.050
Multi-Strategy	0.112 (0.066)	0.043 (0.002)	0.069

Table 12 presents the result for the two-sample t-tests. The values represent the mean return for the strategies in Sweden and Europe without 2007-2009. The difference in mean return in Sweden and Europe with the different time periods is tested for significance. The monthly average return for the whole time period is shown in the parenthesis.

\* = 10 % significance level, \*\* = 5 % significance level, \*\*\* = 1 % significance level

Moreover, a t-test within each region is presented in table 13. The left column shows the values when deducting the years of the financial crisis, while the right column illustrates the original sample values. The result indicates that all strategies, both in Sweden and Europe, generate a higher average return when subtracting the years of 2007, 2008 and 2009. However, Equity Hedge in Europe has the only significant difference in mean between the time periods. Overall, the difference in return for the other strategies between the two time periods is not significant in either Sweden or Europe.

**Table 13: Average Return in Sweden and Europe when accounting for the Crisis**

	2004-2006 and 2010-2014 (%)	2004-2014 (%)	Difference (%)
<i>Sweden</i>			
CTA/Managed Futures	0.045 (0.028)	0.031 (0.022)	0.014
Equity Hedge	0.128 (0.038)	0.126 (0.036)	0.002
Macro	0.042 (0.021)	0.033 (0.022)	0.009
Multi-Strategy	0.112 (0.037)	0.066 (0.045)	0.046
<i>Europe</i>			
CTA/Managed Futures	-0.007 (0.015)	-0.016 (0.013)	0.009
Equity Hedge	0.064 (0.021)	-0.001 (0.021)	0.065 **
Macro	-0.008 (0.009)	-0.008 (0.010)	0.000
Multi-Strategy	0.004 (0.018)	0.002 (0.024)	0.002

Table 13 provides the result for the two-sample t-tests. The values represent the mean return for the strategies, with Sweden first and Europe second. The first column represents the returns for the time period without the years of the financial crisis and the second column shows the return for the whole time period. The difference in mean is tested for significance. Standard errors are presented in the parenthesis. \* = 10 % significance level, \*\* = 5 % significance level, \*\*\* = 1 % significance level

## **8. Conclusion and Further Research**

### **8.1 Conclusion**

The aim of this thesis is to study Swedish hedge funds in comparison to their European counterparts. Additionally, the hedge funds are investigated by examining the performance of four investment strategies. The chosen characteristics of the hedge funds are used to analyse the possible reasons for superior performance in one the two regions.

When examining the hedge funds without separating them by strategy, the average return in Sweden is statistically significant greater than in Europe. This finding provides evidence for Swedish hedge funds outperform European hedge funds. The coefficient of the Swedish dummy is also found to be significant. Therefore, the null-hypothesis cannot be rejected and the result of superior performance for Swedish hedge funds is strengthened. Consequently, the performance may not be related to the location near the European business centre or the larger hedge fund industry and might depend on the separated interest rate and exchange rate in Sweden, as indicated in the hypothesis.

From estimations of the standard deviation, we conclude that all the strategies have statistically significant greater risk in Europe. The Sharpe ratio of the strategies indicates that Swedish hedge funds have higher risk-adjusted return. According to these findings, Equity Hedge is the one performing best in Europe and Equity Hedge and Macro is performing equally in Sweden. Also, conducted from the OLS regression, hedge funds using CTA/Managed Futures or Macro generate lower return than the ones using Equity Hedge. This follows the hypothesis that the most popular strategy, according to past literature, is the best performing one. However, the higher return of the strategies in Sweden is not found to be significant and a superior performance of the strategies in Sweden cannot be stated.

Additionally, the funds in Sweden have statistically significant lower management fee than the ones in Europe, which supports our hypothesis that European hedge funds are more expensive. As concluded from the OLS regression, the characteristics with a positive significant effect on the return are management fee and risk, while age has a negative significant effect. Furthermore, European hedge funds are more expensive, riskier and have been active for a shorter time. These characteristics imply that European hedge funds should

generate higher return. Since this contradicts the findings of the positive effect of the Swedish dummy and the superior performance in Sweden, other characteristics should be of more relevance for the return. Further investigation should therefore be conducted in order to state why Swedish hedge funds outperform European hedge funds.

The results from the t-tests when subtracting the financial crisis of 2008 differ from the original findings. The strategy most affected by the macroeconomic disturbances in Europe is Equity Hedge and Multi-Strategy. In Sweden, the return of Multi-Strategy increases the most when accounting for the crisis. However, the difference in return for Equity Hedge in Europe is the only one found to be statistically significant. The difference in mean between the two time frames for the other strategies in Europe and all strategies in Sweden were not statistically significant.

In conclusion, evidence has been found for the Swedish hedge fund industry to outperform the European hedge fund industry when investigating the return on fund basis. However, when separating the funds by strategy no region was found to perform superior. Finally, to investigate why the Swedish hedge funds generate a higher return, further analysis regarding other characteristics should be conducted. Based on the findings in our thesis, an accurate answer cannot be found for why the Swedish hedge funds outperform European hedge funds.

## **8.2 Further Research**

To investigate why Swedish hedge funds outperform European hedge funds, we suggest further studies on the subject. Other characteristics not examined in this thesis could be important for the performance of hedge funds, such as fund size, more specified location, regulations and market correlation.

One suggested factor in past studies is the size of the fund. Smaller funds tend to have a superior performance, however there is only implications for this to be true (European Central Bank, 2005). It would be of interest to analyse the effect of size on the return and examine the difference in size of the funds in Sweden and Europe, to find a possible explanation on why Swedish hedge funds perform superior.

Moreover, further studies are suggested to investigate the relationship between performance and the specified location of the fund, as mentioned in the conclusion. A more detailed variable measuring the location in the relation to the business centre of the European Union could be included. The local interest rate and exchange rate might also be of importance for the performance of the fund and are therefore suggested in further studies as well.

The difference in regulations between the regions could also be related to the performance of the fund, which would be an interesting analysis. Furthermore, the performance of hedge funds could be related differently to the market situation in Sweden and Europe. Therefore, it could be of interest to include the market correlation in the analysis, to see whether the market has been outperformed over the time period. Since the goal of hedge funds is to outperform the market, this could be an interesting approach.

In summary, the suggested characteristics might enable further researchers to find an explanation on why Swedish hedge funds outperform European hedge funds.

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## 10. Appendix

**Table A 1: List of included European Countries**

Austria	Lichtenstein
Cyprus	Lithuania
Denmark	Luxembourg
Finland	Malta
France	Netherlands
Germany	Norway
Gibraltar	Portugal
Guernsey	Russia
Hungary	Spain
Isle of Man	Switzerland
Italy	Turkey
Ireland	United Kingdom
Jersey	