A Technical Analysis- Based Trading Strategy Explained and Tested

Mikael Kuusisto

Author or authors	
Mikael Kuusisto	
Degree programme	
Business Administration	
Thesis title A Technical Analysis – Based Trading Strategy Explained and Tested	**Number of pages and appendix pages** 64 + 24

Investment decisions are in practice made on the basis of two information sources: fundamental and technical analysis. The Goal of this Bachelor´s thesis was to examine the effectiveness of the second mentioned method in the index, equity, foreign exchange and commodity derivatives markets. The study aimed to find out whether a pure technical analysis based trading strategy can continuously produce positive returns? If it can yield continuously positive returns, then in what market and in which market conditions does it work at its best? The information sources consisted a number of popular books about the subject. In addition two analysts who work with technical analysis answered a questionnaire.

The quantitative research was carried out by first introducing concepts of technical analysis and by studying historical price data from a five-year time frame. The price data of the instruments was selected randomly from four different samples of asset classes. These segments included then 18 different derivative instruments. The price charts were then studied form a market technique- based strategy's viewpoint: The strategy aims to find spots in the market, where movement will appear probably. The periods, through which the prices were studied, were also selected randomly from a 20-year timeframe. These fictitious order executions were obtained by entering the buying and selling signals into a table. From these prices could then be the instruments behaviour describing statistics derived.

The quantitative results of the research showed that technical analysis can be used to some extent to gain continuously positive returns. As the research showed that instruments behave differently, the measure of profitability depends highly on the perspective from which the results are examined. Altogether, the scope of this study was to investigate, analyze and develop the field of technical analysis. The presented strategy represents a simple trend detection method that can easily be enhanced by adding terms and conditions. Private as well as institutional investors can take advantage of the strategy.

Key words
Technical analysis, trading, derivatives, financial markets

Tekijä	
Mikael Kuusisto	
Koulutusohjelma	
Liiketalouden Koulutusohjelma	
Opinnäytetyön otsikko	**Sivu- ja liitesivumäärä**
Tekniseen analyysin perustuvan sijoitusstrategian esittely ja testaus	64 + 24

Sijoituspäätöksiä tehdään käytännössä kahden informaatiolähteen pohjalta: fundamentaalisen ja tekninen analyysin perusteella. Tämän opinnäytetyön tarkoituksena oli tutkia jälkimmäisen tavan toimivuutta indeksi-, osake-, valuutta- ja raaka-ainejohdannaismarkkinoilla. Tutkimuksella pyrittiin selvittämään, voiko puhtaaseen tekniseen analyysiin perustuvaa sijoitusstrategiaa hyödyntämällä tehdä jatkuvaa tuottoa arvopaperimarkkinoilla. Mikäli on mahdollista tehdä jatkuvaa tuottoa, niin millä markkinoilla strategia toimii parhaiten ja missä suhdanteessa? Aiheen tietoperustana käytettiin useita aihealueen suosittuja kirjoja. Näiden lisäksi kaksi teknisen analyysin parissa työskentelevää henkilöä vastasivat vapaamuotoisesti kyselyyn.

Tutkimustyyppinen opinnäytetyö toteutettiin esittelemällä teknisen analyysin tietoperustaa ja tutkimalla historiallista kurssidataa viiden vuoden aikajänteeltä. Hintadata valittiin satunnaisotannalla neljän eri instrumenttisegmentin otoksista. Näistä segmenteistä saatiin valittua yhteensä 18 eri johdannaisinstrumenttia. Johdannaiskursseja tutkittiin markkinatekniikkaan perustuvan sijoitusstrategian näkökulmasta: strategia pyrkii löytämään markkinoilta kohtia, joissa tulee todennäköisesti esiintymää hintaliikettä. Myös periodit, joiden ajalta kursseja tutkittiin, valittiin satunnaisotannalla 20 vuoden aikajänteeltä. Kuvitteellisia kauppoja saatiin syöttämällä osto- ja myyntisignaalit taulukkoon. Näistä kaupoista laskettiin instrumentin käyttäytymistä kuvaavia tunnuslukuja.

Kvantitatiivisen tutkimuksen tulokset näyttivät, että tekniseen analyysin pohjautuvaa sijoitusstrategiaa voidaan hyödyntää jossakin määrin jatkuvan tuoton saavuttamiseksi. Tuottavuus riippuu kuitenkin paljon mistä näkökulmasta tuloksia tarkastellaan, sillä tutkimus näytti myös, että eri instrumentit käyttäytyvät eri tavalla: toiset ovat riskialttiimpia kuin toiset. Opinnäytetyön tavoitteena oli tutkia, analysoida ja kehittää sijoitustoiminnan teknisen analyysin aluetta. Työssä esitelty strategia on yksinkertainen trendintunnistusmetodi, jota on helppo parantaa lisäämällä siihen ehtoja. Strategiaa voivat hyödyntää niin yksityiset, kuten myös institutionaaliset sijoittaja.

Asiasanat
Tekninen analyysi, sijoittaminen, johdannaiset, arvopaperimarkkinat

Table of contents

1   Introduction

Some academics think that making technical analysis based investment decisions is a questionable method. Traditional investment decisions are based on fundamental data, where technical analysis only studies the price, volume and open interest of securities. (Murphy 1999, 37.)

The objective of this thesis is to apply a technical analysis - based trading strategy with historical price data from several security markets. The strategy is based on the "market technique" which aims to find spots in the market where movement will occur with a high probability. The strategy gives the investor the options of whether to hold the security until there are signs of a trend reversal or trading only the first movement. For each option there is an exit strategy which is adjusted to work in favour of the strategy.

1.1   The research problem

The aim of this thesis is to shed light on the technical part of the investment analysis, where news and economical numbers are ignored. As the technical analysis of security prices is held as uncertain and vague, the research problem is interesting and attention drawing.

The main research problem sounds as follows:

- Can a technical analysis based trading strategy produce continuously positive returns?

The more general underlying problems are:

- In which markets does the strategy work or not work?
- Under which market conditions does the strategy work or not work?
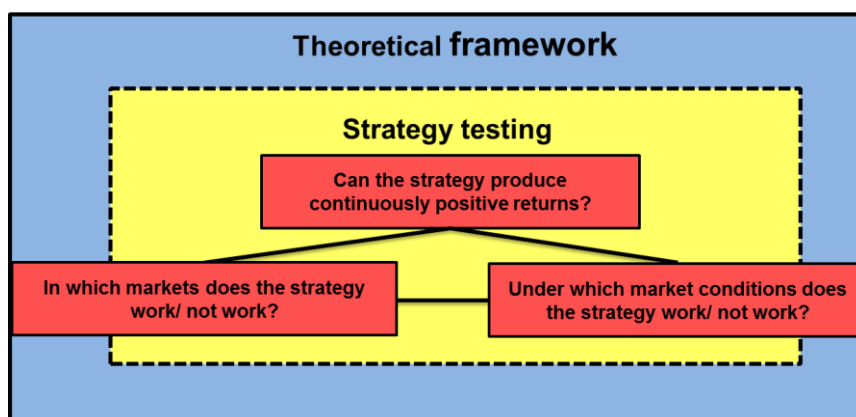
Figure 1. The research problems

All of the research questions refer to the particular trading strategy emphasized in this thesis, they in general also answer whether technical analysis works and in which markets. The basis of the research is formed by multiple books which are used as sources of information, but the main weight is on the trading strategy and the strategy test.

1.2 The theoretical framework

To begin with basic underlying theories such as the Dow-theory, the subject of the thesis gets a solid basis on which to build further theoretical concepts of technical analysis. Making the subject even more interesting, some counter theories and hypothesizes are also introduced. Moreover are basic concepts of technical analysis explained and illustrated. As the thesis moves on to the concept of the trend, it is emphasized from the viewpoint of the market technique. Thus, the main focus of this thesis is on the literature of market technique, on which the strategy tested is dependent on. In addition two questionnaires answered by two technical analysis believers are used to support the theoretical and empirical part of this thesis.

1.3 The methodology of the research

The beginning of this thesis will focus on the most important concepts of technical analysis. The strategy, on which this thesis focuses on is trend oriented, therefore the concept of the trend is emphasized. Later on the concept of the market technique will be derived from the basic concepts of the trend. After this part the reader is introduced to a technical analysis based trading strategy. Moreover the introduced strategy is based on the "market technique" which the author of the book "Das Grosse Buch der Markttechnik" (in English " The Big Book of the Market Technique") Michael Voigt explains a part of the technical analysis of the financial markets.

As the strategy has been introduced, the research has a clear goal: To find out whether the strategy works. To test this problem, the markets were examined. The data was collected from three different markets: equities, foreign exchange and commodities. The instruments could be divided into four groups: index, stock, currency pair and commodity derivatives. From each group five instruments were selected (except commodity due to the concise selection of the broker) and the strategy was tested on a five year time period and the periods were selected randomly from a 20-year time frame. Each entry and exit signal given by the strategy was then entered into a table. The signals could have been buy or short sell signals. The table then calculated return of each trade. From these return rates could be informative statistics computed which gave then reasons to draw conclusions.

2   Introduction to the technical analysis of the financial markets

First let us define what the subject of technical analysis includes. Technical analysis is the study of market movements, primarily through price graphs or charts, aiming to forecast trends. The concept includes primarily three sources of information which are available for the trader: price, volume and open interest. Open interest is only used by options and futures contracts traders. This thesis will mainly focus on the first mentioned source of information. (Murphy 1999, 21-22)

The philosophy of technical analysis is based on three assumptions:
1 The market discounts everything
2. Prices move in trends
3. The history tends to repeat itself

One cornerstone of technical analysis is the assumption that the market discounts everything. Meaning that all fundamental data is ignored and factors like price and volume only count. Thus the technical trader believes that everything that can affect the price of a security (such as political or psychological factors) are already reflected in the price itself. Basically, all that the technical trader is concerned with, is the reflection of bid and ask prices. As the demand rises above the supply, the price should increase. And when there is a larger number of supply, then the price should fall. The technical trader inverts this, and thinks that, if prices rise are the fundamentals bullish and vice versa. This way the technical trader studies the fundamentals indirectly. The chart-oriented traders do not generally wonder why prices may rise or fall, they just believe that it is unnecessary to study the causes. The second assumption proposes that security prices move in trends. Hence a trend which is in effect will with a bigger probability continue its way in the same direction rather than reversing. This is an adaption of Newton's firs law of motion. Put in simple words: An intact trend will continue its way in the same direction, until it reverses. The technical analysis and study of movements in the financial markets is associated with the study of human psychology. For example, price patterns which have been identified and categorized in the last 100 years, tend to appear over and over again. These patterns explain the bearish or bullish psychology of the market. As these patterns have worked in the past, it is assumed that they will work in the future. They are a product of the human psyche, which tends to remain the same. This assumption states that the key to understanding the future lies in the study of the past. (Murphy 1999, 22-25)

2.1 Criticism against technical analysis

The basic argument against the technical study states that the charts tell us only where the market is and was, but will not forecast where the market will go. This argument is always brought up in discussion by technical analysis critics, though every known forecasting method, from weather forecasting to fundamental analysis are based on the study of historical data. (Murphy 1999, 36.)

The random walk-theory states that all price variations are periodically independent, and that the price history has no connection with the future. Simply put: Price movements are random and cannot be forecasted. So, the random walk-theory suggests that technical analysis is useless since all price motion is random and the movement cannot be predicted through past price data. Therefore the random walk is similar to coin flipping. When you throw a coin and it lands on heads, there is no chance to predict any future outcome, because the past has no connection with the future. The idea that stock price returns move randomly was first found by a French mathematician Louis Bachelier in his PhD thesis "The Theory of Speculation". (Kirkpatrick & Dahlquist 2011, 35-36)

However in 1988 A.W. Lo from MIT and A. MacKinlay from Wharton School of Business tested the price change fluctuations between different time intervals. If the random walk hypothesis would have been valid, these fluctuations would have been proportional to the square root of the original intervals fluctuations. Discovering that there was not a direct proportional relationship between the fluctuations they released an article titled "Stock Market Prices Do Not Follow Random Walks". Some researchers who agree that stock market prices do not follow a random walk still do not agree with the validity of technical analysis. However, hey accept that prices may have patterns but they cannot be used to predict the future or they cannot be used to gain superior returns. (Kirkpatrick & Dahlquist 2011, 35-39)

The efficient market hypothesis (EMH) has been considered to be important, therefore it is essential to include it into this chapter. The market efficiency describes how competitive markets respond to information. As new information is available for the investors, it causes turmoil for investors to buy or sell securities. When the information has been "priced" the information is no longer valuable. The EMH was published by Eugene Fama in 1960. It notifies any time any security price reflects all information. This meaning that no investment strategy can be used to outperform the market. The EMH is based on the economic theory of competitive markets. This theory states that arbitrage competition will create efficient

markets. As new information is available, investors will act rationally and the price will adjust to the information. If the price deviates from its true value, arbitrageurs might use it as an opportunity and bring the price back to its equilibrium. The hypothesis has been rejected, since empirical evidence shows that these immediate reactions to information do not exist. The hypothesis states that all market participants receive information at the same time, react to it rationally, and that the arbitrageurs bring the deviated price back to its true value. Information for investors is costly and it does form a controversy. If market prices would always reflect all available information, the investors who pay for information would get no compensation. This was argued by Stanford Grossman and Joseph Stiglitz in their article "On the Impossibility of Informationally Efficient Markets" which was released in 1980. (Kirkpatrick & Dahlquist 2011, 40-42)

2.2   The theory of Charles Dow and Edward Jones

Charles Dow and Edward Jones established the Dow Jones & Company in 1882. Technical analysts agree that what we call "technical analysis" nowadays, has its origins in the findings of Charles Dow and Edward Jones. Charles Dow published his sentiments in a series of articles in the Wall Street Journal. The Dow-Theory is still held as the basis of technical analysis. (Murphy 1999, 41.)

The Dow-theory has six tenets, the first one has coherence with the philosophy of technical analysis: The Indices Discount Everything. Implying that all past, current and future information are discounted and reflected in the index. Though the markets cannot anticipate events like tsunamis or terror attacks, the risk is already priced in the market. If such event happens, the markets react quickly and assimilate their effect almost instantaneously. It is assumed that prices also include information like, interest-rate data, inflation and investor emotions. (Murphy 1999, 42.)

The second premise assumes that the market has three trends. Before we go further into trend behaviour, we have to clarify how Dow describes a trend. In an upward moving trend, every peak after a price rally is higher than the previous peak, and every low is higher than the previous low. In other words, an upward trend illustrates a pattern of peaks and valleys, in which every peak and valley are higher than the previous one. The other way around, a downward trend has peaks and valleys which are always lower than the previous ones. Dow´s definition of trend has lasted, and remains still as the cornerstone of trend analysis. According to Dow, there are three kinds of trends: The primary, intermediate or secondary trend and the minor trend. Dow compared these trends with the tides, waves and curls of

the water surface of the oceans. The primary trend represents the tide, the secondary the waves and the minor the curls. When one stands on the beach watching how far every wave reaches the sand, one can determine which tide is in place. If the following wave reaches a higher point on land than the previous one, it will most likely be a rising tide. If the water lines of the waves are declining, it will be low tide. In contradiction to tides, which last a few hours, are the Dow-theory´s tides lasting from one year to multiple. The secondary or intermediate trend embodies the corrections in the primary trend and lasts from three months to three years. These corrections are normally about one-third or two-thirds of the original movement. The minor trend last less than three weeks, according to Dow. This minor trend forms fluctuations within the intermediate trend. (Murphy 1999, 43-44)

The third premise of Dow´s theory states that the primary trend has three phases:
The accumulation, the public participation and the distribution phase.
 The accumulation phase, where investors are actively buying or selling stocks against the general market direction. These investors have noticed that the market has assimilated the "bad news". During this phase, the market does not change much, since these investors are the minority, and the market supply still larger than the general demand. Eventually, market participants start to accumulate stocks as they notice that the news are getting better. Now the trend is in the public participation phase, where a rapid movement occurs. An increasing quantity of good news trigger speculative buys and the public interest increases positive opinions. Now the distribution phase begins. In this phase the informative investors, (who already bought stocks in the accumulation phase) start to "distribute" or sell their stocks before other participants do. (Murphy 1999, 44.)

In accordance to the Dow-theory, the market indexes must confirm each other. Dow was convinced that a change from the bull market to the bear market happens only when both, the Dow industrial and Dow transports average confirm the same signal. This forms the fourth assumption of the theory. This statement does not imply that the signal in both indexes have to confirm at the same time, but the shorter the time period between the signals lead to a stronger confirmation. If both indexes deviate, is the original trend still in effect. (Murphy 1999, 44.)

Dow thought that volume was an important factor in confirming the buy and sell signals. Simplified, he meant that in a primary upward trend the volume should increase towards the trend and if the prices fall, it should decrease. In a downward trend the volume increases in downward movements and decrease in upward corrections. Dow described this as the secondary indicator and it is the fifth part of the theory. The sixth and last presumption of the theory states that a trend lasts as long as there is not a definitive sign of a reversal. It refers

to the physical law of motion, which says that a moving object tends to stay in motion until external powers reverse the direction of it. This suggests that a reversal is in effect only when the trend is starting to make lower peaks and valleys. More precisely when the last peak was below the previous peak and the price is moving through the bottom level of the previous valley. Some Dow-Theorists are not in agreement regarding whether a trend reversal is in effect when the price has made a lower peak and has moved through the last valley or when it has already made two lower peaks and valleys and is moving through the second lows price level. (Murphy 1999, 45-46)

2.3   Formation of a price change

For a market technique - oriented trader, it is essential to understand how security prices are determined. The thought that there would be a specific procedure by which one could determine the outcome of the effect an event can have on a security price is just an assumption and has no definitive connection with the price construction. The price formation on the derivatives and spot markets works through the balance of supply and demand. This is the secondary function of an exchange. The primary function of an exchange is the allocation of capital, which we will not examine here.

The secondary function of an exchange makes sure that all orders will be forwarded and assigned to the exchange. The trader enters his order via the trading platform of his broker or the bank, and simultaneously this order will be routed to the respective exchange. (*Voigt 2013, 61-62*)

Before we will go further into an example of price determination, we have to clarify the order types. A market order is an order to buy or sell a security at the best available price. This order will be executed immediately if it is entered during opening hours of an exchange. In general, if one is willing to buy a stock, the order will be executed somewhere near the current ask price. If one is willing to sell a stock or enter a short position, the order will be executed with a price similar to the bid price. A limit order determines a specific price. This type of order can only be carried out at the current price or at a more favourable price for the investor. Thus, one can determine if he wants to buy at a price lower than the current price or sell above the current price. Since the limit price sets the absolute maximum price at which one is willing to buy, there is an uncertainty that the order will ever be executed, since the price may never reach the limit price. Similar to the limit order, the stop order or stop-loss order specifies a price at which one is willing to trade. Once a stop order is placed it will hit at the specified or a less favourable price. For example a stock is currently trading

at 10€ a share and a stop sell order placed at 9€ a share. It will become a sell order when the price hits 9€ a share. Usually the stop order is used to limit the risk of loss in case unfavourable price movements take place. A stop-limit order combines the stop and limit order. The order will be executed as a limit order as soon as the price hits the defined limit or a less favourable price. If the price hits the stop level, it will be filled as a stop order. To enter a stop-limit order two prices have to be predefined. (*Hull 2012, 37*)

Now that we have explained the general and most popular types of orders, we will go through a simple example of how orders are filled. Let us assume there is a stock of company x currently trading at 5€ a share and we have the following order book.

Price	Sell	Order type	Buy	Order type	Sellers	Buyers	Turnover
2,50 €	800	Stop	2000	Limit	3350	4200	3350
3,00 €	1000	Stop	500	Market	2550	2200	2200
3,50 €	500	Market	1000	Market	1550	2200	1550
4,00 €	1000	Stop			1550	2200	1550
4,50 €	50	Stop	200	Limit	550	2200	550
5,00 €					500	2000	500
5,50 €	100	Limit	1000	Stop	500	3000	500
6,00 €					600	3000	600
6,50 €	500	Limit	500	Market	1100	3000	1100
7,00 €	50	Limit			1150	3000	1150

Chart 1. The order book of company X´s stock

In the chart 1 we have the order levels listed in the first column, the amount which one is willing to sell in the second column, the type of the sell order in the third column, the amount which one is willing to buy in the fourth column, the type of the buy order in the fifth column, the total amount of sell orders available in the sixth column, the total amount of buy orders available in the seventh column and the turnover or balance of the orders in the eighth and last column. We have at every price (except 3€) an excess of buy orders available. We have a lack of sellers since there are not enough market participants ready to sell (except at 3€). Since at 2,50€ a share there is a total of 3350 ready to be sold stocks and 4200 units ready to be bought, we have the biggest turnover or volume here of 3350. This meaning that 3350 stocks will be traded and the price will decrease to 2,50€ a share. (*Voigt 2013, 62-75*)

2.4 The structure of charts

This chapter is generally for those readers, who are not informed by the construction of charts. The candlestick carts are the Japanese version of the bar charts. These charts have become extremely popular among technical analysts in the western countries during the recent years. The candlestick chart draws the open, high, low and close. The thin line or sometimes called shadow, shows the periodical fluctuation. The wider part of the candle, sometimes called body, measures the distance between the opening and closing price. If the closing price is above the opening price, then the body will be white. However, if the closing price is below the opening price, the body will be black. (Murphy 1999, 51.-55.)
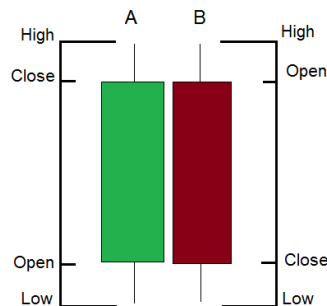
Figure 2. The bullish and bearish candlestick

. In figure 3 we see an upward moving price candle A or commonly called a bullish candle and a downward moving price candle or bearish candle B. The bullish candle is usually painted green or with a bright colour and the bearish candle is usually painted red or with a dark colour. (Nison 2001, 42-43)

Figure 3. Daily chart of the Dax-Index (Prorealtime.com)

To illustrate the basic appearance of the candle stick charts, figure 2. Shows a daily chart of the German Dax index. The candlestick chart can be in an arithmetic or logarithmic scale. The use of logarithmic scaling bring several benefits especially for the use of long term trend

analysis. In an arithmetic scale, does the distance between two points stay the same, independent from the values on the Y axis. In the logarithmic scale, become the percentage increments smaller in relation to the price. This gives the observer a more realistic view of the price changes (Murphy 1999, 51-56)

In this theses will no further chart types or any candlestick patterns be introduced, since they are irrelevant regarding the strategy presented in the subsequent chapters.

2.5 The concept of a trend

For a technically oriented trader, it is absolutely necessary to understand the basic concepts of a trend. All the technical tools that are available, moving averages, trend lines etcetera have only one task: Helping to identify the phase of the trend. There are a lot of quotes that say something similar to "the trend is your friend" or "do not fight the trend", so let us discuss the concept behind these quotes.
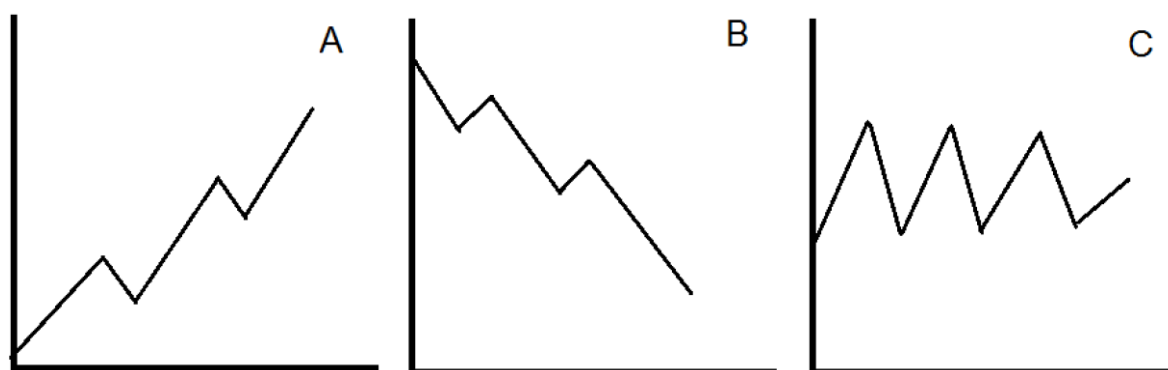
Figure 4. The three types of trends (Murphy 1999, 64.)

All in all, the trend is just the direction of the market, but we need a more precise definition. Markets do not tend to move straight in one direction, but they tend to make a "jigsaw" pattern. This series of zig zags constructs a series of waves, which have easily identifiable peaks and valleys. These peaks and valleys determine the direction of the market. A trend that is structured by a series of higher peaks and valleys, is called an upward or "bullish" trend (Figure 4 A). In contrast, a trend that is making lower peaks and valleys is called a downward or a bearish" trend (Figure 4 B). Moreover a market that is not making higher peaks nor valleys and is oscillating back and forth, is called a neutral or trendless phase (Figure 4 C).(Murphy 1999, 63-68)

When looking more specifically for strong trends they can be identified with the following characteristics:

- There may be a gap opening on the day
- There are higher highs and lows which alternate
- Most of the bars/ candles go into the direction of the trend
- There is very little overlapping between the bars/ candles in the direction of the trend
- The bars have no "tails" meaning the body if the candle is large. Hence the period closes always at new high prices

(Brooks 2011, 307-308)

2.6   Visualization of trends with trend lines

To draw a trend line, the chart should have at least two significant points. These two points are connected with the line so that in the future it is easier to project the possible trend with the other end of the line. The next confirmations of the price at this trend line (which can be described as support or resistance) determine the significance of the line. The more there are so called "testings'" of the trend line, the more significant it is considered to be. If the trend is not able to reach this trend line anymore, but it is making more rapid movements, we are obligated to draw a new line. Also in a trendless situation it is possible to draw trend lines, which tell the trader whether the market is still trendless. In this case the lines are just drawn trough the peaks and valleys. (Murphy 1999, 78-82)

Figure 5. The trend of allstate corp. (Prorealtime.com)

Figure 5.   Illustrates the daily chart of the Allstate corporations stock. We can identify 6 linear testings of the trend line. Therefore the trend line can be held as extremely valid. However trend lines can sometimes be considered two fold. An essential criteria of a trend line is that it has got at least two significant highs or lows, through which the line is drawn. Only when the price has made two corrections, the line can be drawn and be used in the

future. This causes a problem: Hoping that the price will return back to the trend line, following an entry position and hoping it will then bounce back, the price is already relatively high. The second downside is that when a trend is gaining in momentum and is increasing steeper than before, there can be a big gap between the actual price and the trend line. The old trend lines should be replaced or updated with new steeper trend lines, and the trader may start asking himself which trend line is valid. (Voigt 2013, 100-101)

Figure 5b. The accelerating trend of Kone Inc. stock price.

As we can see in figure 5b the trend of Kone´s stock is starting to gain more momentum after April 2012. After this point the traders may have an ambiguous sentiment about which trend line is in effect. Looking at the figure 6 we can see that trend lines can be tricky. Fortunately the market technique offers a simple and effective way to identify the trend.

2.7 Visualization of trends with moving averages

The moving average is one of the most versatile and frequently used technical indicators. Due to its structure and the fact that it can be easily evaluated and tested, it has become an indicator many traders which many traders include in their trading strategy. Chart analysis is mostly subjective and hard to prove. Therefore is the chart analysis hard to program for an electronic trading strategy. In the contradiction can the equations of the moving averages be programmed easily. Chart pattern are often a subject of animosity, where moving averages make clear propositions. The word "average" stands for the mean of the data. For example, if a 10 day average of an instruments closing prices is needed, then we simply add all closing prices of that period together and divide the sum with the number 10. More specifically the equations 1 and 2 on page 33. can be utilized here. The word "moving" is used, because only the closing prices of the last 10 days are used. Therefore does the (10

day) moving average move forward when there is a new trading day and a new closing price. The usual way to determine the 10 day moving average is to simply add to the sum the new closing price of the new day and subtract the closing price of the day, 11 days ago. Instead of the closing price, the opening or mean price can be used. The mean price is in fact the most frequently used type. The moving average indicator has the character of a trend following indicator. Its task is to signal for a trend reversal. However it does not predict future movements in any way. The moving average only follows but does not lead the way. It never anticipates, it only reacts. The moving average follows the market and tell when a new trend has begun, but only after the event. (Murphy 1999, 201-202)
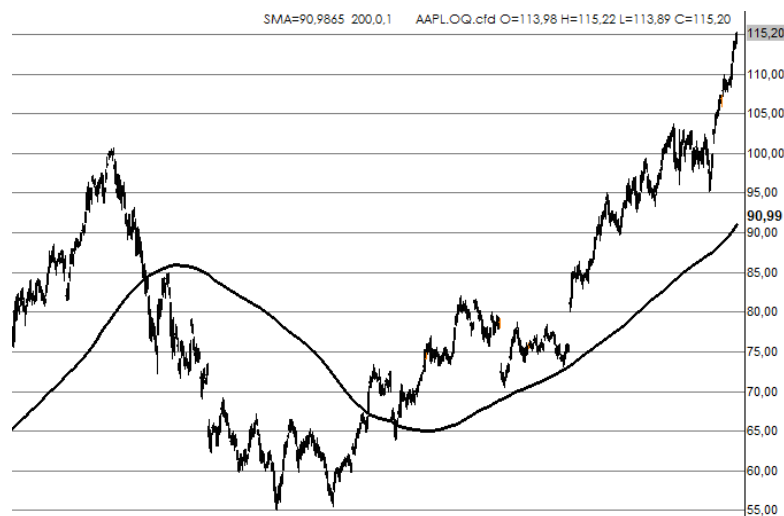
Figure 6. The Apple Inc. daily stock chart with 200 day moving average (200 mong average = black line)

There are several types of moving averages: The simple, exponential and the weighted moving average. In the figure 6 we see the simple moving average on the stock chart of Apple Inc. (AAPL). The last mentioned two types will not be subjects of examination in this thesis. The moving average is a flattened line which makes it easier to read trends. As the price is moving above the moving average it is assumed that the trend is bullish, and when the price drills through the line we are in a bear market. This is the simple concept of the moving average. This chapter was included in this thesis to give a hint what moving averages are, since in the empirical part will different trends of the instruments be determined. (Murphy 1999, 203-205)

2.8 The structure of a trend from the perspective of the market technique

The application of market technique offers an additional way of defining the trend. As mentioned earlier, an upward trend consists of higher highs and lows does and a downward trend consist of lower highs and lows. Let us dig deeper into that definition by imagining the following: A downward trend resembles a ball being thrown down the stairs. As it makes first contact with the first stair it bounces back up. It reaches then a turning point, where it loses its momentum and falls back down on the second stair, which is lower. The ball will bounce up following another fall to the third stair. The stairs resemble the resistance level of the trend, where the price makes shortly a correction following a drop to the next level. The relation between the turning points is irrelevant. Referring to figure 6, the drawing of multiple trend lines can often be problematic. At this point the market technique-based viewpoint makes clear propositions. Every new high follows a low, which does not fall below the previous low. After the low follows a new high, which exceeds the previous high. Through this definition can "dirty" or unclear trends with increasing momentum be understood. (Voigt 2013, 106-111)
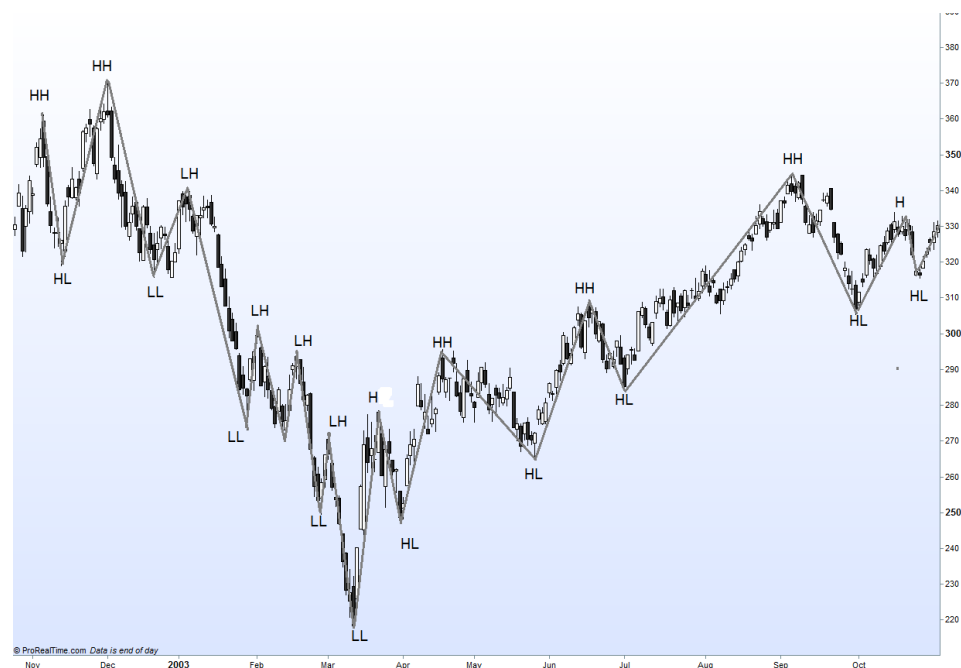
Figure 7. Daily chart of the AEX25-index representing a trend reversal (Prorealtime.com)

In figure 7 the higher highs are marked with "HH" and the higher lows are marked with "HL", where the lower highs are marked with a "LH", lower lows with a "LL" and high is marked with a "H". As soon as we have a lower low following a lower high, the trend would be bearish when the price moves to the next lower low. It important for a trader to think about and understand what the other market participants do and where they possibly locate their

orders. The trader has to ask himself "how will the traders act who are already positioned in the market?" and "where could the outstanding traders place their orders at?" Let us go through the train of thoughts of a beginner trader. In this context are three types of traders mentioned: The beginners, the traders the institutions. It is not the intention to put these types of traders into specific categories or hierarchies, but to explicate the interests and knowledge of these groups. (Voigt 2013, 109-113)
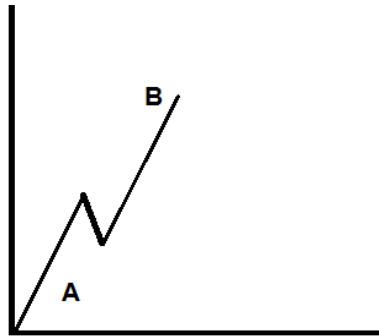
Figure 8. The first movement

In the figure 8 there is an imaginary stock chart of company X´s stock. There has been a rapid increase in value today. This increase is not the outcome of good news nor economic fundamentals, but the result of the demand crossing the supply. Let us assume a mutual fund has bought this stock at the beginning of this movement at point A. Since institutions trade assets at high volumes the price has increased rapidly. This leads us to figure 9.

In general wakes a security the interest of the private investors and beginners only until there has been some significant movement. In other words: Because of this rapid increase, is this stock mentioned on the internet, television or in magazines. The beginner sees this movement as an outstanding participant and decides to buy this stock at point C. At the same time are some market participants positioned with a floating profit, due to this rapid increase. At this point some traders are satisfied with their profit and decide to sell their position. Simultaneously some other beginners also want to be a part of this trending stock and decide to buy. (Voigt 2013, 115-117)
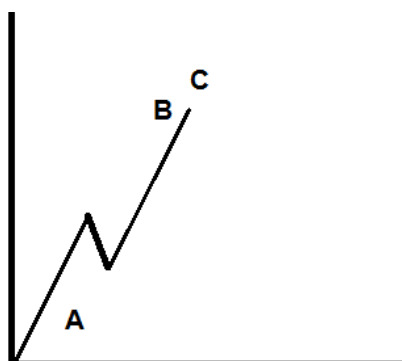
Figure 9. The beginners enter the market.

At the point C in figure 9, the majority of the traders start to sell their stock and the beginners are buying. There is now more supply than there is demand. Small order volume meets big order volume. An additional group of market participants are flat, this means they are standing outside and monitoring the market. This group has patience to wait for a signal. As the supply overlaps the demand the market reverses and the stock is traded down. (Voigt 2013, 115-117)
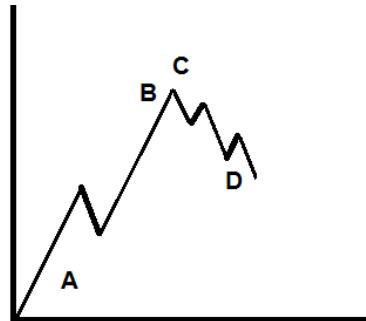
Figure 10. The correction

In figure 10, the traders who bought at the very peak of the price are probably now positioned with a floating loss, depending where they opened their position. Now some of the traders tend to close their position since they think they had predicted the stock wrong. They have now entered their order on the bid side of the order book. On the other side there are other participants who are willing to buy this stock for strategic reasons. Their goal could be to buy the stock because they want to participate in the company board or they act as a mutual fund. In this case is the pull back a very favourable opportunity to buy this stock. For additional traders the pullback could start to make first signals for them and the rest is just observing. (Voigt 2013, 118-119)
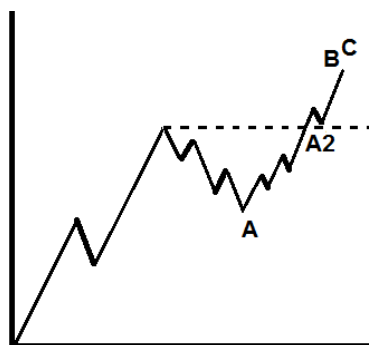
Figure 11. The second movement

In figure 11 the price is starting to finish the correction and moving into the original direction, due to bigger orders that are in the market. Those orders can be orders of institutions which start to accumulate more of the stock (point A). Therefore there starts to be more demand again. As the price rises above the last peak, the market technique oriented traders buy the

stock (point A2). The stock will be traded above the peak due to large demand. At this point the beginners who sold for a bad price feel angry. They experience that they had a right opinion about the stock prices development and they decide to buy the stock again (at point A in figure 12). (Voigt 2013, 118-119)
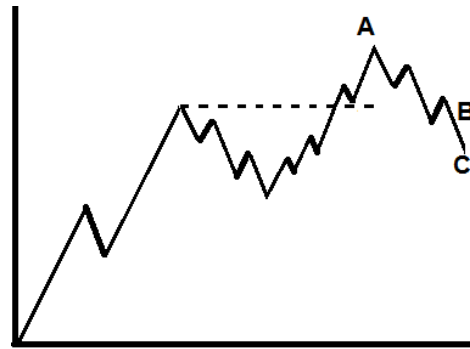
Figure 12. The second correction

At the same time the profit of the traders (who were already positioned at the beginning of the movement) increase. This could eventually lead them to closing a part of their position or the whole position (at point A). The traders (who now open their position), buy the stock from the traders who have made profit. The stock has risen much and is starting to lose interest in the short-term. This leads to another pull back which leaves a second peak behind. The private investor or beginner finds himself now in the same situation as in figure 8. Due the fallen price the beginner has made some loss. Some of the beginners close now their position in fear of an even bigger loss. (Voigt 2013, 119-120)
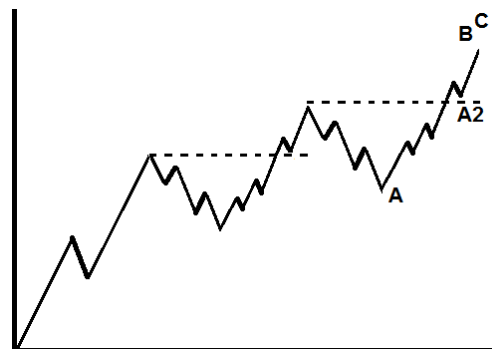
Figure 13. The third movement

This is where the institutions start to gain interest in the stock again. They could speculate on a trend and open a position in the correction. Traders who have analyzed the chart of the stock now have an opportunity to speculate on another movement. Some could have drawn trend lines or some may get a signal from trend following indicators. Some institutions may start buying and speculating for a new movement. The trend has already made two movements up and two corrections. Therefore the trend is stable and it can be assumed

there will be another movement up. Observers (position flat) may change to potential buyers (position long). Now basically the same happens as in the prior movement. On the other side the standing traders who bought at the very peak are now forced to close their position. These traders sell their position to the new speculators. As the price crosses the recent highs level institutional traders might buy some more of this stock, because most likely a movement will appear. Again those traders who opened their position at the bottom of the correction, have gained profit. Some may already sell their position at this point. Some participants may have gained some interest on the stocks trend and are waiting for an entry signal. New beginners may be greedy and buy themselves into the trend. The retail trader finds himself in the same state as in figure 9. He may feel like the market is always going in the opposite direction with his position. The problem is that the trader entered the market at the high and that is why he may feel that the market goes in the opposite direction. (Voigt 2013, 121-122)
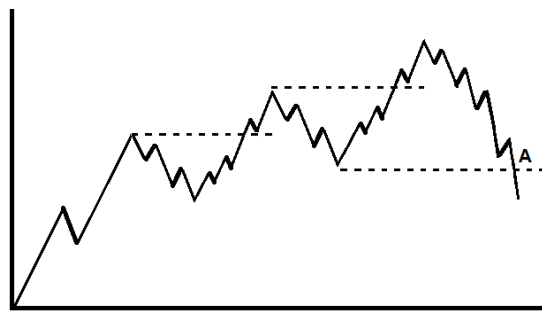
Figure 14. The break out

Eventually the trend will be broken (Figure 14) and the price falls below the level of the recent low. Now the traders, who are positioned can be divided into two groups: Traders who hold strictly onto the definition of the trend and their trading plan and traders who have no clear definition of a trend. This could result in the psychological phenomenon that retail traders who were positioned at the last peak, do not close their position, since they believe there will be another high. Their positions value decreases now rapidly. The traders who have a clear understanding of a trend have the opinion the trend is now broken. It could have been first trend lines broken for example. The types of traders who follow the market technique have placed their stops at the recent low. As the price has moved through that level, these stops are triggered. In other words, the sell orders are filled, (figure 14, point A) which may result a larger movement down. (Voigt 2013, 122-124)
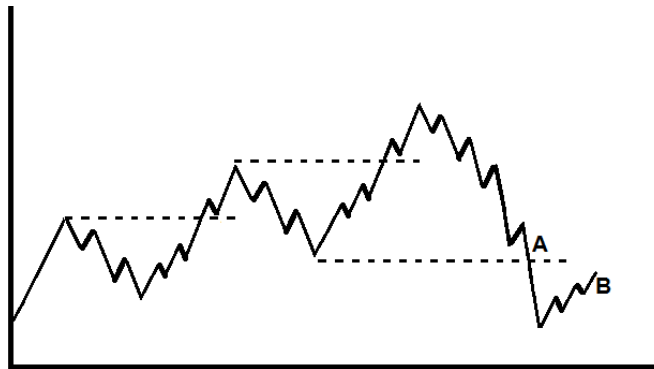
Figure 15. The first lower high.

At the end of the first movement down some retail traders may want to buy more stocks since they want to cover the losses and break even with a better price (point B). This may be a part of the reason that the market recovers slightly. At this point the buyers can be divided into two groups: Buyers who already owned the stock and now buy more and buyers who now open their position for the first time. They may believe in a short speculative increase of the price. (Voigt 2013, 124-126)
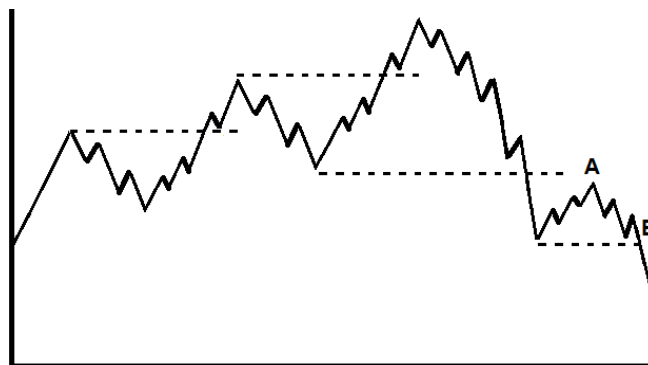
Figure 16. The second movement down.

These buyers confront the traders who have not yet sold their position. Some of these traders may have the idea of closing their position in the upward movement (figure 15, point A), since it is a good opportunity to sell for a better price. Also institutions may start selling their last long positions here (figure 16, point A). There is now a bigger volume on the sell side of the market and the price will be traded down. In figure 16 the upward trend was only broken. This does not automatically mean that there will be a trend reversal. The market does however fall below the recent lower low and that changes the opinion of many market participants. Since there has been a high, low, a lower high and a breakout through the low, the definition of a bearish trend is now in effect. When the lower low is broken more sell orders will be triggered and the market continues its downward movement (figure 15, point B).
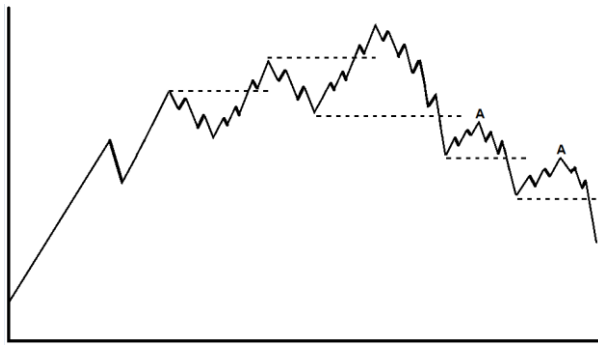
Figure 16. The lower lows and highs.

As the downtrend has been confirmed the trend may make multiple corrections. At each small correction institutions may try to sell their positions. Since for example mutual funds trade at high volumes, their orders may lie in the market from several hours to days until they get filled. This is why there may be a rapid movement down after each correction (figure 16, point A´s). (Voigt 2013, 125-126)

2.9 Entries in the market oriented trading

In this chapter the entry points of positions will be defined. These entry points are derived from the market technique, which focuses mainly on identifying the trend and forecasting movements. The chapter "The structure of a trend from the perspective of market technique" explained that a trend consist of highs and lows. It turns out that these levels are often a meeting point of the orders. When entry orders, stop orders and entry orders for reversing a position are placed at the same spot, it can be assumed that there will occur some short-term movement. The different points that are relevant for understanding the concept are named as 1, 2, and 3. 1 is the starting point or the recent low. 2 is the new high (or low) and 3 is the new low (or high). So in an uptrend, the price moves from 1 to 2 creating a peak called 2. After the peak follows a valley called 3. The price recovers from the valley and moves through the level of 2 creating a new peak. So it is assumed that from 3 to a new 2 (high), there should appear some movement. The short positioned trader places his stop order to buy back the security at the latest high. This is important for a trend oriented trader, since when the price moves through the recent high, it should be assumed that the trend is no longer in effect. Therefore he must enter a long position. He may also double his position, so that when his short position is stopped, he will simultaneously enter a long position. This means that if he is one unit short he must enter two positions long to own a long position. Some orders may be entered by traders who are flat and are speculating for an uptrend. As the price moves through the level of 2 the order is triggered and the trader "is long". Meaning

that the trader has bought the security. So according to the market technique, orders are placed at the level of 2. (Voigt 2013, 289.)

Additional attention should be paid to the 1-2-3 patterns, which may cause a "domino-effect". Meaning that there could be a small 1-2-3 inside a bigger 1-2-3 where the smaller 1-2-3   triggers the orders and makes the price skyrocket trough the level 2 of the bigger 1-2-3. This is illustrated in figure 17. When trading this kind of formation, it should be considered whether both level 2´s are close enough to each other especially when trading the movement, not the trend (In figure 17, distance A). (Voigt 2013, 290-291)
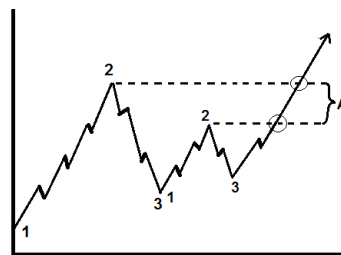
Figure 17. The domino effect.

A similar effect can be observed between different timeframes. For example a 1-2-3 pattern on a hourly chart where the level of 2 is at a same level of a 2 at the daily chart. This may lead to a strong signal. Therefore a trader should always combine charts of different timeframes. A tick-chart trader should observe the 10 minute chart, a 10 minute chart trader should observe the hourly and so on. (Voigt 2013, 290-291)

The trader should always give the breakout two chances. As the figure 18 illustrates, the price is about to break through the level of the recent low. When looking at a smaller timeframe the price has already broken the level but has pulled back. It takes the price longer to break through a specific level when observing the price at a larger timeframe. Therefore the trader should be ready to enter the same position again if the position were stopped. (Voigt 2013, 292-293)
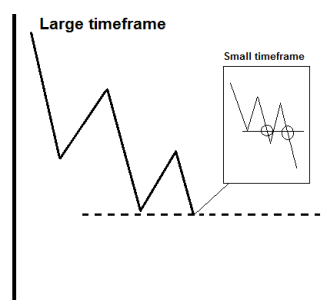
Figure 18. The failed break out.

Another aspect which the trader should pay attention to, are the daily highs and lows. These levels can be used as entry points in intraday trading, because they tend to provide high order volume. The daily high and low lines can be categorized in four different lines: The High of the day before, the low of the day before, the high of the day before yesterday and the low of the day before yesterday. The high and low levels of the day before should especially be respected when answering the question "where will movement appear in the market?" The reason why the market tends to move at these levels, is that institutional investors, such as mutual or hedge funds may trade at the daily timeframe. This means that these market participants monitor the daily chart to analyse possible entries or exits. They may for example enter a long position at the high of yesterday and adjust their stop at the lowest point of the previous day. The institutional investors certainly also monitor intraday timeframes but the larger volume still lies at the daily timeframe. When looking at the open interest of common futures contracts, it can be noticed that the volume of overnight positions mainly surpasses the volume of intraday positions. Due to the stop strategy mentioned above, these levels provide a concentration of orders with high volumes. The market oriented trader can therefore use these levels to speculate on a short-term movement. The daily highs and lows, provide levels such as the 1-2-3 formation does, where traders open, close or possibly need to turn their position around. Therefore the market oriented trader should derive rules to his trading plan. If the high of the day before is at the same or close to the level of the peak of a 1-2-3 pattern, the signal may be very strong. In both cases the entry criteria of the two different market participants meet and therefore it can be speculated on a movement. This is illustrated in figure 19, with the Citigroup´s stock 10 minute chart. The first point 2 of the 1-2-3 pattern happens to be also the high of the previous day, and therefore provides a relatively reliable signal. The same applies to the second signal. (Voigt 2013, 322-324)

Figure 19. The daily highs and lows.

Not only the daily highs and lows provide significant levels: Opening and closing prices are considered to be significant levels. The opening level can be determined when the exchange opens and the first price is listed, where the closing level is of course determined through the closing price of the last day. The opening price is not only significant in the opening trading session but throughout the day. This phenomenon could be a result of market participants sending their stop buy orders right in the beginning of the trading day when the first price appears on the price list. Therefore when the price reaches the level of the opening price later during that trading day, the bundle of buy orders then triggered. The opening price is not only relevant for entering a position but also for exiting a position. The traders who entered their position at the breakout through the opening price, will most likely place their stop order at the same level. This is why a trader should take the opening price in account also when planning where to put the stop order. The closing price provides a significant level because in the options and futures markets, the positions are calculated using the closing price. This means that when a trader holds his position over the night, will he get the profit or loss calculated in relation to the closing price of that particular trading day. Therefore the closing price might be a mental buying price and determines the buyer whether the position has a floating profit or loss. The closing price of the previous day has a major role especially when the price is listed with a gap the next day. For example a security´s price opens with a gap down the next day and continues to drop further. The short positioned traders who held their position overnight have a decent floating profit at this point. Soon they find out that their profit starts to diminish as the price rises. These short-term oriented traders will at the latest close their short position at the level of the closing price of yesterday. Hence, that level may generate some price movement. (Voigt 2013, 330-336)

2.10 Stop- orders in the market oriented trading

As the famous quote says "Cut your losses short, let your winners run", we cannot highlight the importance of the stop too much. We have generally three different tasks of the stops: Reducing loss, protecting profit and taking profit. The first stop, also called the initial risk stop, will be placed shortly after a position has been opened. This stop can be placed based on percentage, volatility or price. This stop can also adjusted following a market technical strategy, which we will emphasize later. The idea of the breakeven-stop is that it will be placed at the entry point shortly after the market has been running in the profitable direction. This type of stop is still a loss reducing stop, since there are commissions' costs to pay and possible slippage between the entered price and the execution price. The profit protecting stop (also called as the trailing stop), will be dragged behind the market price. This stop remains a loss reducing stop until the price rises above the execution price. Classic types of trailing stops are the percentage and price stops. E. g. If a stock rises from 9 to 10 €, the stop will be placed at 9 €. The profit taking stop is also called as the profit target stop. This stop is placed in advance to close the position if the price hits a specific target price. E. g. The stop is placed 10€ from the entry, and the price action after the exit is not relevant for the trader as long there are no new trade signals. The stop can also be placed with a time limit. Meaning that the position is closed after a certain time period. A trend is always constructed of movements and corrections. Whether the trader is informed of these or not, or whether his strategy follows these elements or not, the trader is always concerned with them. That way should the trader before an entry ask himself what element is he going to trade? The trend, the movement or the breakout? Because of this, should the stops always be adjusted in coherence with the target. (Voigt 2013, 217-225)

2.10.1 The outside and inside bars

The inside bars or candles that are discussed in this chapter represent no classic candlestick pattern and should not be confused with candlestick formations. These inside and
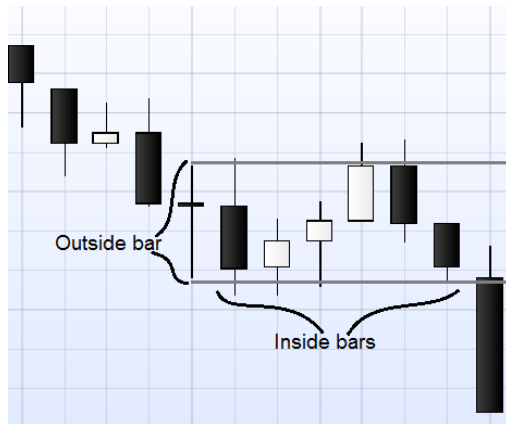
outside bars also do not represent any sideway phase of a trend.First let us have a look at the figure 20, where the so-called outside and inside bars are mentioned and illustrated. The first significant bar, the outside bar, is defined as a bar which has high and low points that extend above and below the opening and closing price of the following bar.

Figure 20. The outside and inside bars.

This means that whenever the next candles body is within the price range of the previous candle, we are speaking about an inside candle. It does not matter which time period we are looking at, this phenomenon appears at all timeframes. As we can see in the figure 20, the following six candles open and close within the borders of the outside bar. The outside candle is not significantly bigger than the other candles in this example. Attention should be paid to the fact that the security can be traded at prices above or below the bounds of the outside bar as long as the opening and closing price stay within the boundaries. As long this criteria is in effect, an inside bar is in place. Let us observe another figure to demonstrate more examples of the inside and outside bars (figure 21).((Voigt 2013, 249-252)

Figure 21 Daily Chart of the euro bund future (Prorealtime.com)

As the figure 21 illustrates it is obvious that the inside bars appear often. The grey areas cover the inside bars. After an outside bar the price is often traded above the extension of the outside bar but the price still bounces back into the area of the outside bar. We have to notice that there is also often variation between the directions. The inside bars switch the direction alternately. Observations have also shown that the volatility decreases drastically after an outside bar. These outside and inside bars will play a major role in the next paragraphs.

2.10.2 The trailing stop

Since the market technical oriented trading is all about searching for spots where movement will occur probably, we also expect that after the entry point there is some favourable movement. Like we already emphasized in the chapter "entries in the market oriented trading", do the best movements occur when the graph has made a clear 1-2-3 pattern and the price is moving towards the next point 2. It is also favourable that little inside candles occur during this movement. When trading the movement other rules have to be set. If the trader wants to trade only the primary trend movement, he cannot use a simple stop which is set at the previous low for example. Instead he must adjust his stop to the movement. The classic trailing stop seems to be a good way to adjust with the movement. In this type of technique the stop is always set at the previous periods low (or high, in the case of a short-selling position). This kind of stop seems to work in agreement with the quote "cut your losses short, let your winners run". It also is a simple form of a volatility stop. When the market forms small candles or in other words there is little volatility, lies the stop near the current price. (Voigt 2013, 247-248)

Let us have an example of the classic trailing stop (figure 22). A trader identifies a clear 1-2-3 formation on the Spanish IBEX-index. Instead of the trend, he decides to trade the movement to take as little risk as possible. So he decides to enter a stop buy order at 9954 basis points. The positioning is reasoned trough the theory base of the construction of a trend. (Voigt 2013, 248-249)

Figure 22. The 1-2-3 pattern
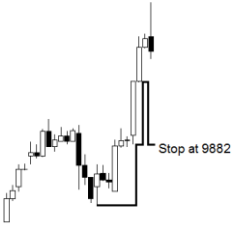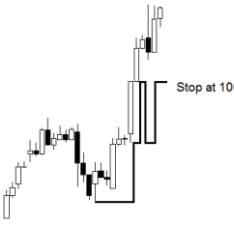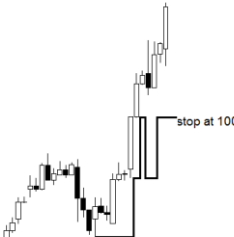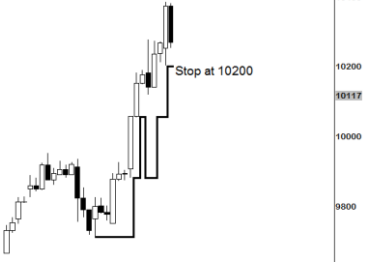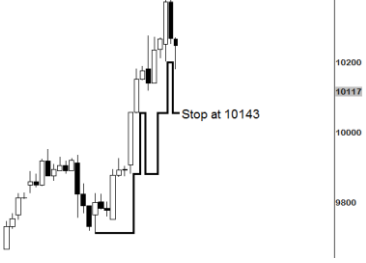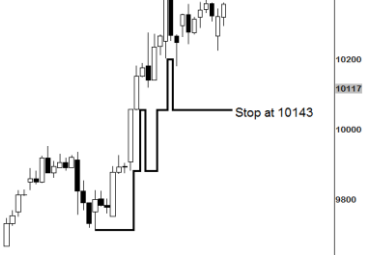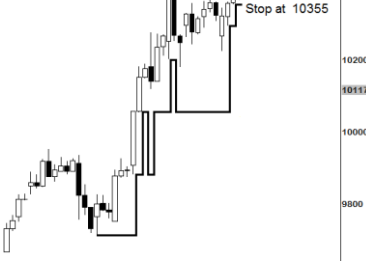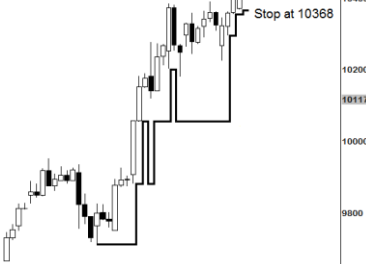
Figure 23. The entry.

So the position was opened at 9954, at the breakout trough the level of the point 2. The position gets stopped or is sold at 10151. Although the trade was clearly profitable, we still can say that the stop did not exactly meet our needs: When observing closely the chart (in figure 23.), it can be identified that the stop was filled exactly where inside bars appeared. Hence we can enhance the trailing stop, by paying attention to the inside bars. So let us observe the same trade step-by-step adjusting the stop with the inside bars.

	Figure 23. In the first period the order is executed at 9954 basis points. The trader cannot place the stop at the current periods low nor at the previous period low, since it can be recognized that the previous two candles were inside bars of one bigger candle. So the stop has to be set to 9714 basis points.
	Figure 24. In the second period the stop can be dragged to the previous periods low, since that period broke out of the inside bar zone. Now the stop lies at 9882 basis points.
	Figure 25. In the third period the trader is happy to drag the stop above the breakeven- level (to 10054 basis points). No inside bars in sight here.

	Figure 26. During the fourth period the trader notices the third period closed inside the second period's price range. Now the stop is adjusted so that a false stop is avoided. The stop will therefore be dragged back to the period´s low before the previous period (to 9882 basis points). At this point the position would have been closed with a classic trailing stop.
	Figure 27. In the fourth period the index climbs above the outside bars range, but does not manage to hold and eventually returns back inside the zone. The criteria of an inside bar holds, and the stop remains at its initial level (at 9882 basis points).
	Figure 28. The fifth candle breaks out of the previous inside bar zone but stays within the boundaries of the previous period. So the fifth candle is again an inside bar of the fourth candle. Therefore the stop can be set to 10054 basis points, since this is the low before the current outside bar.
	Figure 29. Next the candle remains within the boundaries of the outside bar, so the stop cannot be moved. The stop stays at 10054 basis points.

	Figure 30. The seventh candle after the opening manages to break out of the previous inside bar zone, so the stop can be pulled higher (to 10200 basis points).
	Figure 31. But again, the prices do not manage to hold the level and the eighth period opens and closes within the range of there is an inside bar in place, so the stop has to be moved back (to 10143 basis points).
	Figure 32. The next nine periods the index is traded at prices within the outside bars range. The prices fluctuate and the volatility decreases. Therefore the stop remains at its level.
	Figure 33. Eventually as the price manages to rise above the high of the outside bar, the stop can be moved to 10355 basis points. At this point the trader must consider whether the current price is too close to the stop and if the stop should be moved back.
	Figure 34. The price manages to rise enough and no inside candles are in place. The stop can be dragged carefully to 10368.

	Figure 35. The next period rises also rapidly and the stop can be adjusted to 10395 basis points.
	Figure 36. Finally the position is closed after 22 candles at 10490 basis points with a return of 536 points.
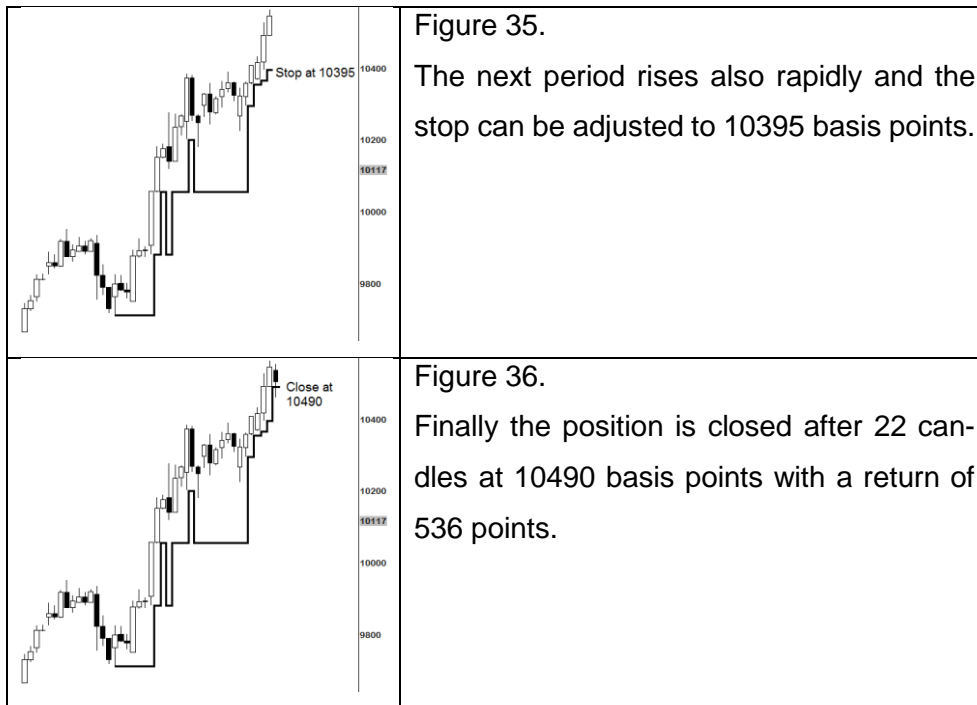
(Voigt 2013, 248-258)

2.10.3 Characteristics of the trailing stop
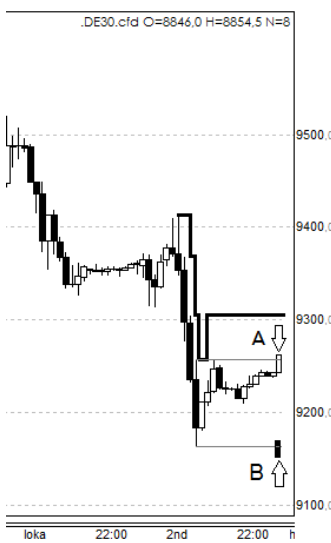
In figure 36 we have two different scenarios. A trader enters a short-selling position on the DAX-index. As the fourth period closes inside the range of the third, the stop has to be dragged back to 9300. After this the volatility decreases and the price fluctuates inside the range of the outside bar. In scenario A eventually the 17th period closes above the upper border of the outside bar. As this happens, the positions has to be closed as soon as possible, since the definition of an inside bar does no longer stand. In scenario B the price closes outside of the fluctuation range and the stop can be moved to its high during the next period. (Voigt 2013, 254.)

Figure 36. The two scenarios.

Another phenomenon a trader should pay attention to, is the fact that the volume of the market may decrease at some point. It would be naive to assume that immediately after entering a position the market moves quickly with large volume in the favourable direction. Even if this would happens could some small candles occur at some point, meaning that the change of the period is very small. The result of this is that the relocation of the stop could be negligible. These periods occur mainly in the intraday timeframes and the reasons

may lie in the trading hours. For example at midday can small order volume be observed. This is a result of the self-fulfilling prophecy, where market participants estimate small order volume during lunch time and therefore do not trade. Also when the institutional traders stop trading at some point, will the volume decrease drastically. It remains the small order volume of the day traders and the few institutions. (Voigt 2013, 263-262)

2.11 Synopsis of the strategy

All the "market technique" oriented rules mentioned in the previous chapters are considered to be effective on every timeframe, from the monthly chart to the tick chart. The trader has to clarify himself which would be the most suitable. The smaller the timeframe the more frequent the trading will be and the closer the stops will be. When trading on the tick chart, the stops might be only a few basis points away, where on the daily chart the stop might be several hundred basis points away. Therefore it is logical to look at the available margin when it comes to choosing the timeframe. It is also clear that the time, which the trader is willing to offer for trading, correlates with the decision of the timeframe. (Voigt 2013, 351-352)

The point 2 of the 1-2-3 pattern is used to predict small term movement which the trader can participate on. Here the point 2 will only be seen as a trigger of short term movement. The break out or movement can be traded on every timeframe available, however when observing timeframes below 10 minutes, does the use of the trailing stop lose its meaning. It should be especially kept an eye on whether the market is on the larger timeframes in an immediate distance to a larger 1-2-3 pattern. If this is the case the underlying timeframes can offer a good opportunity to trade effectively. The trader should avoid positioning against the market which is about to break through a significant level on the large timeframe. When trading the movement the trader basically puts the risk on the money. In this strategy is the trailing stop used to let the market take the trader out of the position. Instead of the trailing stop, can the break out also be traded by determining a specific amount of basis points where the exit order will be placed. Since the exit is located only a few basis points from the entry, has the trader the opportunity to trade with a higher contract or unit volume.

When trading the movement should the trader watch out for significant resistance or support levels in the larger time frames. In case the market has already moved far in the favorable direction, should it be taken in consideration to close a part of the position or even the whole position at these levels. It is also essential to know that it may occur sometime that the market does not immediately break out through the point 2 of the 1-2-3 pattern but makes a small consolidation only to break out. Therefore if the position got stopped in the first place, should the second time the price moves through the level 2 be traded. This was

explained and illustrated in the chapter "entries in the market oriented trading" (figure 18.). Another way of speculating on upcoming movement are the daily highs and lows as well as the opening and closing prices of the previous days. These levels are valid on every timeframe there is, since these levels are static numbers. If these levels are located in the immediate distance to a 1-2-3 pattern, may the signal be extremely strong. (Voigt 2013, 360- 363)

2.12 Statistical concepts for measuring risk and return

To understand the tables in the appendix and the numbers introduced in the results section, the methods of calculating the different numbers will be explained in this chapter. Risk management is one key factor when it comes to success in trading, therefore it is essential to keep track of the trades made. Statistical concepts are a powerful tool for analyzing and making conclusions. Whether investment returns, earnings growth rates, asset prices or some other financial data is analyzed, statistical methods are there to quantify and tell the analyst the important features. (Defusco, McLeavey, Pinto & Runkle 2004, 61-63)

2.12.1 The discrete versus continuous returns

The discrete return of the time interval $[t-1,1]$ can be calulated

$$R_t = \left(\frac{P_t}{P_{t-1}}\right) - 1$$

where P_t is the asset price at the end of time the interval $[t-1,1]$ and P_{t-1} is the asset price at the beginning of the time interval $[t-1,1]$. In order to get the return of a multiperiodical interval it is necessary to compound the returns of each sub period multiplicatively. This is called geometric composition.

$$R_{[0,T]} = \prod (1 + R_t) - \mathbf{1}$$

Where R_t is the return of a sub period.

The principal disadvantage of discrete returns is their non-additive character due to the equation above. When calculating returns, we need to add up the returns. Fortunately we have the concept of the continuous returns.

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

where P_t is the price of the asset at the end of time the interval $[t-1,1]$ and P_{t-1} is the price of the asset at the beginning of the time interval $[t-1,1]$. ln means natural logarithm, which has the base of the Euler number e . This means that the natural logarithm $y = \ln(x)$ fulfills $x = e^y$. By computing the natural logarithm of the returns we can compound every return additively. This is called arithmetic composition. The continuous returns take values less than or equal the discrete return. Normally discrete returns are used but when calculating statistical data with returns, it is recommended using continuous returns rather than discrete returns. Therefore all returns used in this thesis are log returns. (Defusco, McLeavey, Pinto & Runkle 2004, 61-63)

2.12.2 The arithmetic mean

The arithmetic mean is the most frequently used number to describe a possible outcome of an investment decision. This number gives the investor the center or middle of the data.

It is computed simply by adding up the observations and dividing the sum by the number of observations. Two cases are distinguished;

Equation 1. The sample mean $$\mu_S = \frac{\sum_{i=1}^{N} X_i}{N}$$

Equation 2. The population mean $$\mu = \frac{\sum_{i=1}^{n} X_i}{n}$$

Where X_i is the observation and n the number of observations.

The sample is a subset of the population. The population represents all available observations. The arithmetic mean is easy to calculate but is sensitive to extreme values. Hence the mean may give misleading information in some cases. The weighted arithmetic mean can be used to weight each mean with the amount of observations. This happens simply by multiplying the observations with the decimal share of the whole sample of observations (Burton, Carroll & Wall 2002, 28-31)

2.12.3 Standard deviation

The standard deviation tells the dispersion of the outcomes and is therefore a good determinant to measure the riskiness of an asset. Since variance is calculated in measured units we need to measure the data also in the original units:

Equation 3.The sample standard deviation $\sigma_S = \sqrt{\dfrac{\sum_{i=1}^{n} (X_i - \mu_s)^2}{n-1}}$

$$\text{or} \qquad \sigma_S = \sqrt{\sigma_S^2}$$

Equation 4. The population standard deviation $\sigma = \sqrt{\dfrac{\sum_{i=1}^{N}(X_i - \mu)^2}{N}}$

$$\text{or} \qquad \sigma = \sqrt{\sigma^2}$$

Where X_i is the observation, μ the mean and n is the number of observations.
(Burton, Carroll & Wall 2002, 44-46)

2.12.4 Coefficient of variation

To measure relative dispersion of some observations, the coefficient of variation gives us relatively valuable information. It relates the measure of dispersion, or the standard deviation to the arithmetic mean. The coefficient of variation is simply calculated by dividing the standard deviation with the arithmetic mean.

Equation 5. The coefficient of variation $CV = \dfrac{\sigma}{\mu}$

Where σ stands for the standard deviation and μ for the mean return. This determinant gives valuable information of the assets returns related to the riskiness.
(Burton, Carroll & Wall 2002, 46-47)

2.12.5 The Sharpe ratio

The Sharpe ratio measures an investments performance by dividing the excess return with the standard deviation of the instrument.

Equation 6. The Sharpe ratio $\qquad S_a = \dfrac{E[R_a - R_b]}{\sigma_a}$

Where R_a is the return of the instrument, R_b the return of the risk free instrument and σ_a the standard deviation of the observed instrument. Government backed treasury bills are commonly used as the risk free instruments. (Berk, DeMarzo 2013, 363-364)

2.13 Contracts for difference

Contracts for Differences or later abbreviated as CFD´s were chosen for the data collection. These CFD´s are financial derivatives. The word derivative means that something is derived from something else. Therefore the price of the derivative is not dependent from the demand and supply, as the price of a stock would be. The price development of the CFD is dependent from another financial security's price. This concept is broadly known, as there are many different derivative products. For example the futures or options are very similar. Still the price structure of them is more complex. The price of an option can for example be dependent of the **u**nderlying security, volatility, interest rate sentiment and/or the maturity of the contract. With the CFD´s is the concept simpler. The price development is 100 percent dependent on the price of the underlying instrument. Assuming the stock price of Santander Group would increase by 3%, would the CFD´s value also increase correspondingly. Moreover the CFD´s do not have any maturity dates. (Riβe 2005, 17-30)

The CFD´s were found in 1980 as they were first only traded by institutional investors especially in the interbank market. Among the professional investors are the CFD´s not only known as "Contracts for Difference", but also as "Equity Swaps". This name was derived from the fact that they were used for hedging back then. By hedging is the act of securing the original position with a contra position in case unfavorable movement occurs meant. Only in 1990 during the speculation bubble, was the CFD´s market opened for private traders. The demand of the CFD´s grew rapidly, especially in the United Kingdom. This was because the CFD´s were tax free products. (Riβe 2005, 17-30)

These CFD instruments have many positive characteristics. Therefore it is easy to understand why they have become so popular among traders. Firstly there is a large selection of underlying instruments to trade with CFD´s. And the market place is always the same: The broker. Secondly the price structure is transparent. The price of the CFD equals always the price of the underlying. There is no complex equation to determine the price. Thirdly, the CFD´s make short selling possible on every market. In some countries is short selling forbidden and therefore have the investors to rely on derivatives. But not all stocks have an option or future contract to trade with, but the CFD´s allow the traders to trade almost every instruments derivative. Also the low transaction costs are an aspect which makes them so popular. (Riβe 2005, 17-30)

3　The strategy testing

The research showed that the market technique-based strategy works in some markets and in some not. The functionality depends in some cases highly on the individual instrument. The returns of each instrument were very different. Some instruments produced high returns, where other instruments gave almost no positive returns. Some of them gave highly positive returns but the standard deviation of the returns was high. As these instruments gave very different results it is time to analyze which of them were the most effective and why.

Since the strategy aims to find out spots where movement in the market will occur probably, the strategy works at its best in markets where other traders think the same way. In other words, the strategy works in markets where market participants enter their order in the same spots where the strategy would suggest entering. It remains clear that we are talking about highly liquid assets. In other words, assets that trade at high volumes. Simply said: Securities that are popular. The trailing stop, which aims to trail the current market price tightly but diverges when there occur inside bars, appeared to be very effective. In many cases when inside bars appeared, the position would have been already closed using a traditional trailing stop. But using the enhanced trailing stop, the position remained open and eventually the price continued to move into the favorable direction. The trailing stop managed in some cases to signal for an exit just before the reversal into the unfavorable direction and therefore produced excellent results. However there were only few of those trades. The principal idea of the enhanced trailing stop is to filter out the signals which produce movement. Therefore entries that do not turn out to be profitable are closed. That is why the trailing stop works so effectively in the right market.

3.1 How the strategy was tested

All instruments tested were picked randomly from the WH Selfinvest Limited´s CFD selection, with the random number generating function of Microsoft Excel. All CFD´s were derivatives of spot instruments, so no future or options derivatives were used. The instruments were categorized in indices, stocks, foreign exchange, and commodities. Five instruments from each category were tested (excluding commodities, since the brokers selection was concise).

The random numbers generating function selected the following instruments in the following categories:

Category	Underlying	Instrument
Indices	DAX-Index	DE30.CFD
	FTSE 100 Index	UK100.CFD
	S&P 500 Index	US500.CFD
	Nikkei 225 Index	JP225.CFD
	Dow Jones EURO STOXX50	STOXX50.CFD
Stocks	Cisco Sytems Inc.	CSCO.OQ.CFD
	E.ON AG	E.ON.CFD
	Wells Fargo & Co.	WFC.N.CFD
	Lloyds Banking Group	LLOY.L.CFD
	Aegon N.V.	AEGN.AS.CFD
Forex	American Dollar/ Japanese Yen	USD/JPY.CFD
	British Pound/ Swiss Franc	GBP/CHF.CFD
	British Pound/ American Dollar	GBP/USD.CFD
	American Dollar/ Danish Crown	USD/DKK.CFD
	American Dollar/ Hungarian Forint	USD/HUF.CFD
Commodities	Gold	GOLD.CFD
	Silver	SILVER.CFD
	Brent Oil	BRENT.CFD

Instruments that were included in the the research

The individual time periods were also picked randomly from a time period of 20 years back from the end of the year 2013. The reason a 20-year period was selected was because the research had to allow the chance of including all types of economic cycles: A bull market, a bear market, a trendless phase and a crisis. Each instrument was tested on the daily chart through a period of five years, which could be divided into yearly periods. The randomly selected periods were: 2002, 2005, 2006, 2010 and 2011.

So that the test was implemented with an objective attitude and to retain the validness of the research, each trade was executed virtually without peeking into the future. In other

words, a trade was virtually executed by scrolling through the chart and every time a signal was identified, it was entered into the Excel-sheet. The future was always kept covered on the chart to avoid possible subjective attitudes towards the strategy. After the trade was entered into the Excel-sheet, the chart was scrolled forward and at each period the trailing stop was adjusted. As the stop was eventually virtually triggered, the closing price of the position was entered into the Excel-sheet.

3.2   Strategy and market originated problems

Although the book "Das Grosse Buch der Markttechnik" describes the strategy very thoroughly it remained one problem: How to identify the significant highs and lows. The trader´s judgmental ability has a major role in defining them. Therefore for example the strategy is hard to program for an electronic trading system. One could determine for example that a significant high forms whenever after an increase there is a five percent reversal in place. This aspect remains to be solved by the trader. The second problem which occurred was more market oriented: Some of the randomly selected instruments ended up to be very volatile. Especially some stocks moved after a 1-2-3 pattern almost directly into the right direction, but fluctuated so much that the positions were stopped before the price broke even. Those fluctuations were mostly gaps between the prices.   Another problem was the integration of bid and ask spreads into the analysis. It was impossible to find out precise historical spread data from the years between 2001- 2014. Therefore the calculations do not take the spread or possible slippage between the market price and execution price into account. However the main idea was to find out if the strategy could signal for strong movements, so I consider a few basis points of inaccurateness to be insignificant in terms of the research.

4   The test results

In every instruments section the reader is first introduce to a chart which describes in which phase of the trend each instrument was during each individual period. The phase of the trend was determined simply: If the price was most of the time (>90%) above the 200 day simple moving average line the trend was considered to be bullish. If the price was more than 90% of the time below the 200 day simple moving average the trend was considered to be bearish. Moreover, if the price was above and below the 200 simple moving average line was the trend considered to be neutral. In other words, the trend was assumed to be in a sideways phase. This determination of the trend phase is a simple adaption of the 200-.moving average concept (page 12). It is not the intention to simulate better returns through the trend filter, but to determine whether the direction of the trend has an effect on the returns. We will begin with the index derivatives, move over to the stock derivatives and then examine the results of the foreign exchange and commodities derivatives.

4.1   The index derivatives

The portfolio of the index derivatives included the German DAX-Index (Deutsche Aktienin-dex), the United Kingdom's UK100 index (FTSE 100), the American US500-index (Stand-ard& Poor´s 500), the Japanese JP225 (Nikkei 225) and the European STOXX50-index (Euro Stoxx 50).

	DAX	UK100	US500	JP225	STOXX50
2002	Bearish	Bearish	Bearish	Bearish	Bearish
2005	Bullish	Bullish	Bullish	Bullish	Bullish
2006	Bullish	Bullish	Bullish	Neutral	Bullish
2010	Bullish	Neutral	Bullish	Neutral	Neutral
2011	Neutral	Neutral	Neutral	Neutral	Bearish

Table 1. The trend of the different indices during different periods

The chart 1. Indicates each instruments trend during each period. It can be identified some correlations in the first two periods between the instruments: The first period (2002) was a bear market and the second period (2005) a bull market. Also the final period was in 4 cases clearly a neutral market. The table 1 will be used in the upcoming chapters to find out whether it is favorable to trade in the same direction as the trend is.

Chart 1: The cumulative log returns of the index derivatives.

The chart 1 illustrates the development of the cumulative returns of the index derivatives. We have the percentage of the cumulative returns on the y axis and on the x axis the amount of trades made. The index derivatives gave the highest returns of the whole portfolio of securities. As we cans see in the chart above, the returns of the STOXX50- CFD (dark blue line in chart 1.) remained almost all the time above all other index-instruments. The US500-CFD (grey line line) produced steady and likely returns as the STOXX50-CFD until it deviated. The DE30-CFD produced the second best cumulative log returns, though the returns remained below the STOXX50-CFD´s, US500- CFD´s and JP225-CFD´s cumulative returns most of the time. The cumulative returns of the US500 -CFD ended at 2,85% points above the cumulative returns of the JP225-CFD. The UK100-CFD was the only instrument of the studied index derivatives, which did not produce any significant returns and which ended up with a cumulative negative return. Now that the returns of the index derivatives have been compared in general, it is time to dig deeper and go into the specifics of each instrument.

4.1.1 The DE30.CFD

DE30 is an abbreviation for the DAX-index or more precisely the Deutsche Aktienindex. The DE30-CFD was traded 41 times during the 5 periods. Of those 41 trades were 28 (68,29%) long positions and 13 (31,71%) short. The overall cumulative logarithmic return of the DE30-CFD was 33,80%, where the maximum positive return was 22,04% and the maximum negative return was -7,92%. Both extreme return cases were short sell positions and will be analyzed later in this chapter. The mean return was 0,82%. During the period of the year 2002, 8 trades were made, where 6 of them were short positions and 2 long positions. The sum of these trades was -2,64%. Since this period was bearish the long positions were filtered out and a positive return of 1,46% was the result. During 2005 8 trades were also executed, of which 7 were long positions and 1 a short position. The cumulative return of this period was 4,45%. As according to the chart 1 the trend was bullish we could filter the short position out, and get a sum of 2,97%. The year 2006 produced also 8 signals, of which 7 were buy signals and sell signals. The cumulative return was 3,63%, but since the trend was bullish during that year we could filter the short selling positions out, and the return was 3,02%. The period of the year 2010 was bullish for the index. It produced 5 buy signals and one sell signal. The cumulative return was 8,96% but filtering the short selling positions out, it led to a return of 9,23%. According to the chart 1, most of the studied indices were in a neutral phase during the year 2011 including the DAX. Therefore no filtering of the positions was needed. During this period were 7 long positions entered and 4 short. The sum of the log returns during the year 2011 was 19,40%. The high return of this period is highly dependent on the best trade of the instrument, which produced a return of 22,04%. (Appendix 1)

4.1.2 The UK100.CFD

The UK100-CFD is a derivative instrument of the United Kingdom´s FTSE 100 index. This instrument provided 49 trade signals, which is the most of all index derivatives. There were 29 (59%) long positions and 20 (41%) short positions. The cumulative logarithmic return was -1,29% and therefore the instrument performed the worst compared to the other index derivatives. The best trade gained a return of 7,88% where the biggest loss was -3,78%. These returns led to a sample arithmetic mean return of -0,03%. The standard deviation of the returns was 2,32%. During the period of 2002 the instrument indicated 10 1-2-3 pattern of which 7 were sell signals and 3 buy signals. The non-filtered cumulative logarithmic return of this period was -7,73%. Referring to the chart 1, the period was bearish so by filtering the long positions out, the return was -4,98%. In 2005 the index produced 10

signals, of which 7 were buy signals and 3 sell signals. The sum of the returns was 3,64% and by filtering these sell out signals, the return would have been 3,47%. During the year 2006 there were 12 trades made of which 10 were long positions and 2 short. The sum of the returns of the trades was 1,27% and again by filtering the anti-trend directed positions the sum was -1,81%. In 2010 the index produced only 5 signals. 4 were bullish and 1 bearish. The return of these signals was 4,11%. As the trend was considered to be neutral, no filtering was necessary. The next year, the trend remained neutral but signaled 12 trades. Of those signals were 7 sell and 5 buy signals. The sum of the returns was -2,58%. If we sum the filtered returns of all cumulative returns of the UK100-CFD, the result is -1,79%. So filtering the trades with the trend direction did not lead to better returns in this case. (Appendix 1)

4.1.3   The US500.CFD

The US500-CFD has the Standard & Poor´s 500 index as its underlying instrument. This CFD produced 43 signals during the five year period. Of those 43 signals were 21 (49%) bullish and 22 (51%) bearish . The sum of the returns was 16,59%. The maximum positive return was 12,17% and the maximum negative -4,78%. All the returns gave an arithmetic mean return of 0,40% and a standard deviation of 2,90%. During the period of 2002 the index gave 8 signals to sell and 2 to buy. The return of the period was 9,48%. Using the trend filter, the returns were enhanced to 10,17%. In 2005 the index created 8 signals, of which 4 were bearish and 4 bullish. Though the index was considered to be in a bullish phase, it produced mixed signals. The return of those 8 trades was 3,74%. Using the trend filter the return was 0,64%. During the time period of 2006 the S&P 500 formed 10 signals, 8 buy signals and 2 sell signals. The cumulated return was -2,33%. The bullish state of the index led by filtering to a total return of -1,09%. The year 2010 formed only 5 signals, 3 long signals and 2 short signals. The return of this period was 3,17%. By filtering the short trades out, the result was 6,54%. The trendless phase in 2011 produced 4 bullish signals and 6 bearish. The total return was 2,54%. As the index was moving sideways, no filtering was needed. By adding up the filtered returns the sum was 24,56% which differs a lot from the non-filtered returns of 16,59%. (Appendix 1)

4.1.4   The JP225.CFD

The Japanese Nikkei 225 index derived instrument numbered a total of 40 signals. 22 (55%) of them were signals to buy and 18 (45%) signals to sell. Those 40 trades resulted with a return of 13,74%. The most positive return trade resulted a return of 9,33% and the most negative resulted a return of -5,07%. The arithmetic mean return was at 0,34%. The standard deviation of the returns was 2,79%. During the first test period 2002, the index produced

8 signals to trade. The sentiment was more bearish, since 5 signals proposed to sell. The remaining 3 signals where therefore buy signals. The sum of the returns was 1,16%. Filtering the long positions out, the returns increased to 6,39%. In 2005 the strategy composed 12 signals. The period was clearly bullish, due to only 2 sell signals. By filtering these 2 short positions out, the total return of the trades decreased from 9,73% to 7,50%. As 2005 was an active period, the year 2006 produced only 5 signals on the index. There were 4 buy signals and 1 sell signal. The sum of the returns of these 5 trades resulted -2,66%. Since the period was neutral, no filtering was needed here. In 2010 the derivative gained 9,05% in returns, thanks to a successful position on the 4.5.2010 which produced a 9,33% profit. Filtering was also not necessary here. The last period 2011 created 9 signals, of which 3 were buy signals and 6 sell signals. These signals produced a negative gain of -3,55%. As the period was neutral, the positions were not filtered. The sum of the filtered positions was 16,73%. Therefore the filtering increased the profit by 2,99% points from the non-filtered total returns. (Appendix 1)

4.1.5 The STOXX50.CFD

This index derivative has the Dow Jones Euro Stoxx 50 Index as its underlying index.
The return of this instruments 40 trades was 52,13%, which is the highest yield of all instruments in this research. 27 (67,5%) of the signals were bullish and 13 (22,5%) bearish. The highest return of an individual trade was 24,11% and the lowest -3,55%. Therefore the mean return, 1,30% is the highest compared to the other index derivatives. The standard deviation was 4,64%. During the period of 2002 the CFD was traded mostly on the short side, since 7 positions were sold short and 1 bought long. The return of these trades was 6,77%. As the trend was bearish, the long position were filtered out, which return of 10,14%. In 2005 the index gave 10 signals, 9 to buy and 1 to sell. These trades resulted a return of 6,30%. Due to the bullish market sentiment, the one short position was filtered out, and we got a total return of 5,85%. Due to a strong signal in 2006 the strategy produced a return of 13,44%. The returns included 9 trades, 8 long and 1 short. The sentiment was clearly also bullish here so the filtered returns were 14,43%. 2010 gave 6 signals, 5 long and 1 short. The performance of these signals was 1,27%. In 2010 the index was neutral-directed so no positions will be filtered out. During the year 2011, 7 1-2-3 patterns appeared on the index: 4 bullish and 3 bearish signals. The sum of the returns of the 7 trades was 24,37%. As the index was mostly bearish, the bullish signals were filtered out, which resulted a 23,11% performance. All filtered returns added up a performance of 54,80%. This total return did not differ significantly from the non-filtered return of 52,13%.(Appendix 1)

4.2 The stock derivatives

The randomly picked stock portfolio included the following instruments: CSCO.OQ.CFD (Cisco Systems Inc.), E.ON.CFD (E.ON AG), WFC.N.CFD (Wells Fargo & Co.), LLOY.L.CFD (Lloyds Banking Group), AEGN.AS.CFD (Aegion A.S.). These instruments had the following trend during the five year period.

	CISCO	E.ON	WELLS-FARGO	LLOYD	AEGION
2002	Bearish	Bearish	Bearish	Bearish	Bearish
2005	Bullish	Bullish	Bullish	Bullish	Bullish
2006	Bullish	Bullish	Bullish	Neutral	Bullish
2010	Bullish	Neutral	Bullish	Neutral	Neutral
2011	Neutral	Neutral	Neutral	Bearish	Bearish

Table 2. The trend of the stocks during different periods

According to the 200 moving average concept the first period was bearish and the second year bullish on every instrument. The year 2011 was mostly neutral for the stock instruments.
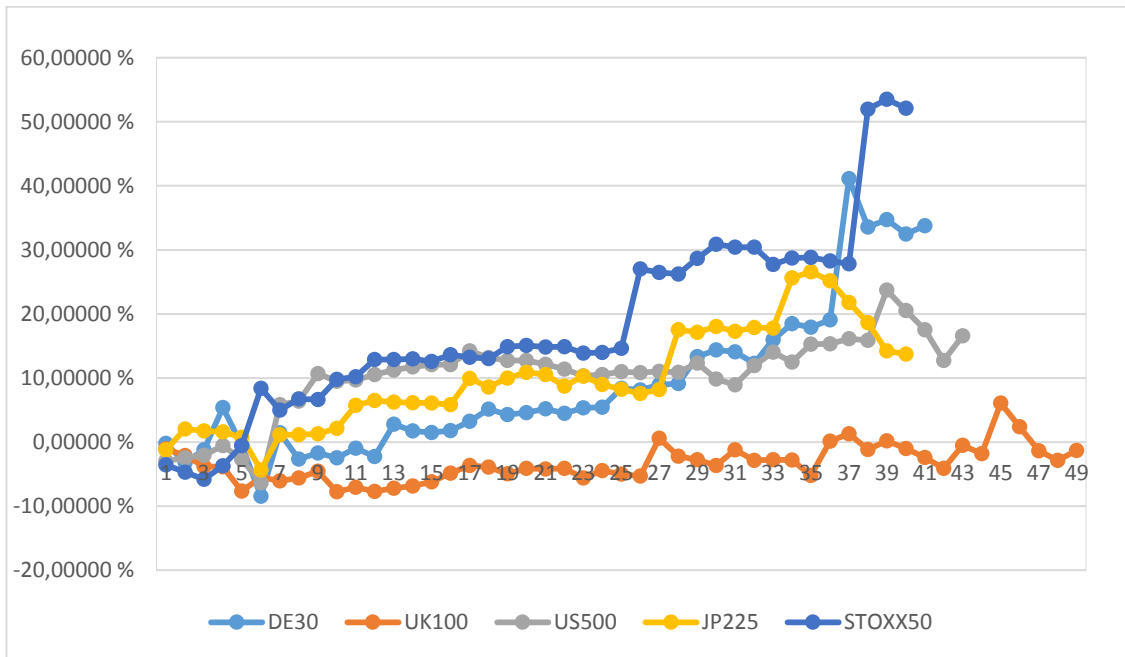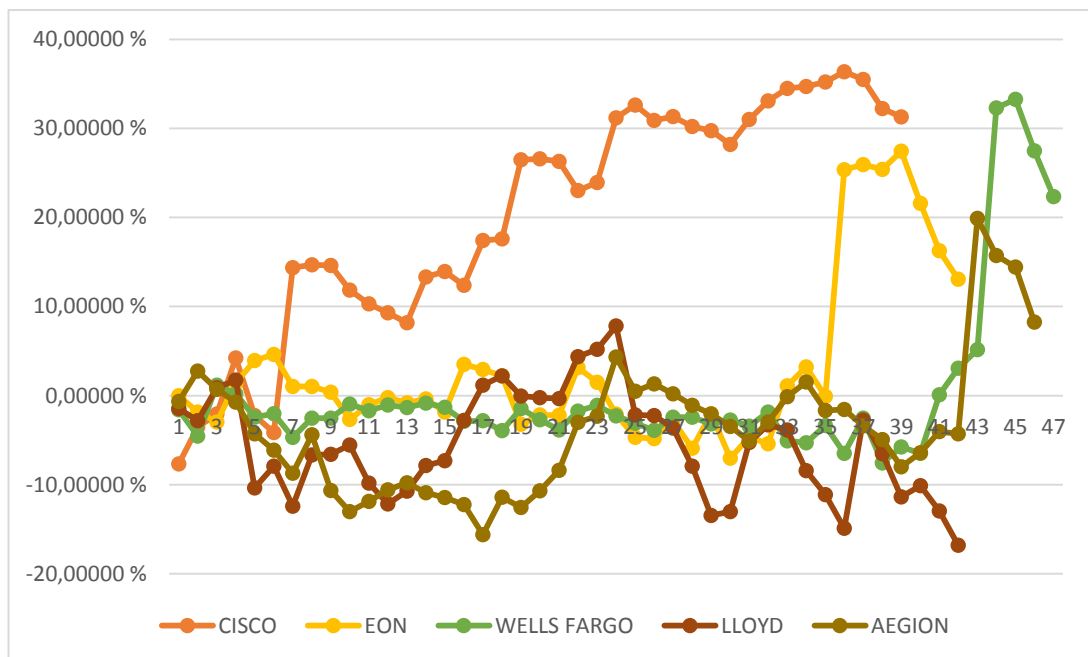

Chart 2. The cumulative log returns of the stock derivatives

The chart 2 illustrates the development of the cumulative returns of the stock deriv-atives. We have the percentage of the cumulative returns on the y axis and on the x axis the amount of trades made. We can see in the chart, the stock of Cisco Sys-tems Inc. (orange line) performed the best. The standard deviation 4,38% of the in-struments returns was also the lowest compared to the other stock derivatives instruments. Where the other four instruments kind of oscillated around the break-even level, the returns of the CISCO-CFD kept accumulating steadily. As we can see in the chart 2 the positive returns of the other instruments were mainly dependent on trades with abnormal returns. Excluding CISCO and LLOYD (brown line) other instruments returns got significantly posi-tive due to the abnormal returns in the end. The derivative of the Lloyds Banking Groups stock was the only stock of these instruments, which ended up with a sum of negative re-turns. As these stocks produced various kinds of returns, it is interesting to study them more thoroughly.

4.2.1 The CSCO.OQ.CFD

When looking at the overall return, the derivative instrument of the Cisco Systems Incorpo-rated's stock was the best performing instrument of the randomly selected stock derivatives. The 39 virtual trades resulted a total 31,30% return. 12 (31%) of these 39 trades were long positions and 27 (69%) short positions. Hereby we can see that the trading was focused on the sell side of the market. The mean return was at 0,80% and the standard deviation was 4,38%. In 2002 the stock was extremely volatile, since it produced 7 sell signals which gave very deviating returns. During the same period were both, the most negative (-7,68%) and positive (18,50%) returns giving positions of the instrument traded. The sum of all returns of 2002 was 14,37%. The trend was clearly bearish but no positions were filtered. The stock gave in 2005 9 signals, 7 sell signals and 2 buy signals. All signals resulted with a negative -1,99% return. The trend was neutral so, no filtering was needed here. During the year 2006 8 1-2-3 patterns appeared on the chart. 4 of them indicated to buy and 4 to sell. The total return of these positions was 18,81%. The price oscillated around the 200 moving average so no clear trend was in sight until the end of the year. 2010 formed 8 signals, 4 long and 4 short signals. The return of these signals was 1,91%. The trend was also neutral during this year. The period of 2011 gave 7 signals. 5 of them were bullish and 2 bearish. The total return of these positions was -1,80%. The trend was clearly bearish until the end of the year, so by filtering the two long positions out, we get a filtered return of -0,03%. By adding the filtered returns up, we get a return of 33,07%, which is 1,77% points better than the original sum of the returns. (Appendix 2)

4.2.2 The E.ON.CFD

The German E.ON stock formed 42 signals during the 5-year period. 25 (60%) of them were bullish and 17 (40%) bearish. All positions gained in total a return of 10,62% with a standard deviation of 4,98% and a mean return of 0,25%. In the first period, only 4 positions were traded: 2 long positions and 2 short positions. The sum of these returns was -1,02%. The period was neutral so no positions will be filtered. Where 2002 was a passive year, giving only 4 signals , 2005 was much more active. This period gave 9 buy signals and 3 sell signals. The return of these signals was 2,08%. Since the stock was trending up, it was reasonable to filter the short positions out. That led to a return of 5,27%. 2006 was also an extremely bullish period, since it produced 6 buy signals, and 2 short signals. The return of these signals remained negative: -5,58%. Filtering the short positions out the return was -3,88%. In 2010 the stock was in a bear market since the price was mainly below the 200 moving average. This year produced 7 signals. 2 of them were buy signals and 5 of them short signals. The non-filtered return was -2,58% and filtered 0,19%. The year 2011 was also considered to be bearish. 5 bearish and 6 bullish patterns were identified on the chart. These positions gave a return of 17,72%. By filtering out the 6 long positions, the return was 14,17%. As the original sum of returns being 10,62% and the filtered return being 14,73%, filtering the positions with the trend led also here to better results. (Appendix 2)

4.2.3 The WFC.N.CFD

The stock derivative of the Wells Fargo & Company was virtually traded 47 times. 24 (51%) of the positions were short positions and 23 (49%) of them were long positions. These trades produced together a return of 22,35% with a standard deviation of 4,67% and a mean return of 0,48%. During the first period the instrument was traded 10 times, 6 times on the buy side and 4 times on the sell side. These 10 trades resulted a return of -0,95%. The stocks trend was considered to be trendless in the period, so the positions will not be filtered. In 2005 13 signals appeared on the chart. 4 long signals and 9 short signals. Though there were more short positions, the trend was assumed to be neutral. The sum of these returns was -0,15%. 2006 was the first period to show a significant development of the trend. This period involved 9 positions, 6 of them were long positions and 3 short positions. The performance of these positions resulted as -0,73%. Counting only the long positions in, the performance was -0,34%. The year 2010 gave 7 signals, 2 buy and 5 sell signals. The performance was -3,94%. During the period, the stock price was mostly oscillating sideways so filtering the positions would have been irrational. With a total return of 28,13%,during 2011, the performance finally broke even. The high yield was a result of one ex-tremely good signal on the 3.8.2011 as the price moved down from 18,20€ to 13,88€ per contract. Filtering was also not necessary here. The sum of the filtered positions returns was 22,75% which is 0,40% points better than the original performance. (Appendix 2)

4.2.4 The LLOY.L.CFD

With a total return of -16,78%, the Lloyd Banking Groups stock CFD derivative, was the most non-profitable instrument included in this research. The derivative was virtually traded 42 during the test period: 24 (57%) times long and 18 (13%) times short. The most positive return of one trade was 12,18% where the most negative return was -12,13%. Hereby the mean return of the security was -0,40% and standard deviation 4,40%. The CFD was traded 8 times during the first period. The positions where evenly divided into 4 long positions and 4 short positions. The return of these trades was -6,66%. According to the trend filter, the trend was bearish so the filtered return was -3,06%. 2005 gave 8 signals, 5 long signals and 3 short signals. The return of this period was 3,86%. With the period being neutral, the positions were not filtered. In 2006 the strategy produced 7 signals, 4 bullish pattern and 3 bearish. The return of this period was 8,01%. Filtering the long positions, the result was 6,23%. 2010 did not produce any significant returns. The total return was -13,62%. In this period the security was traded 11 times, 8 times long, 3 times short. This period was neutral so the filter was overlooked. The year 2011 produced 8 patterns, 3 bullish and 5 bearish patterns. The return was -8,37%. With the trend filter the returns increased to a positive 0,99%. With the original total return of this security being -16,78% and the filtered total return being´-5,60% we could again witness that it is preferable to trade into the direction of the trend. (Appendix 2)

4.2.5 The AEGN.AS.CFD

The Aegon´s CFD instrument gave a total of 46 signals to trade. 27(57%) signals to buy and 19 (43%) to sell the CFD short. These signals resulted a performance of 8,26%, a mean return of 0,18% and a standard deviation of 4,56%. The difference between the opening and closing price of the best trade was 24,18% and of the worst -6,25%. Giving 10 signals during the first period the stock was very active. The trend was clearly bearish though the signals were evenly divided into 5 bullish and 5 bearish signals. The period gave a cumu-lative return of -13,02%. The short positions alone produce a loss of -3,69%. In 2005 the stock chart drew a total of 11 patterns which all were bullish so the trend was strongly bull-ish. The return of these 11 long positions was 4,64%. During the year 2006 there were 9 signals, of which 6 were bullish and 3 bearish. The return of this period was 4,94%. This period was neutral. 2010 gave a total return of -1,47%, with 5 short positions and 3 long positions. This period was also neutral or trendless. The last test period 2011 gave also 8 signals. 2 of them suggested to buy and 6 of them to sell. The return of this period was an outstanding 13,18%. The market was also here in a trendless phase. With a filtered return of 17,60% and a non-filtered return of 8,26% we can again see that identifying the direction of the trend is essential when making trading decisions. (Appendix 2)

4.3 The foreign exchange derivatives

The randomly selected foreign exchange derivatives included the following instruments: the USD/JPY.CFD (American Dollar/Japanese Yen), the GBP/ CHF.CFD (British Pound/Swiss Franc), the GBP/ USD.CFD (British Pound/ American Dollar) , the USD/ DKK.CFD (American Dollar/ Danish Crown) and the USD/HUF.CFD (American Dollar/ Hungarian Forint.

	USD/JPY	GBP/CHF	GBP/USD	USD/DKK	USD/HUF
2002	Bearish	Bearish	Bullish	Bearish	Bearish
2005	Bullish	Neutral	Neutral	Neutral	Neutral
2006	Neutral	Neutral	Neutral	Bearish	Neutral
2010	Bearish	Bearish	Neutral	Neutral	Neutral
2011	Bearish	Bearish	Neutral	Neutral	Neutral

Table 3. The trends during different periods of the foreign exchange instruments.

There were 9 bearish periods, 14 neutral periods and only two bullish periods. Hereby the the foreign exchange derivatives did show only 2 periods with a clear bullish trend. Due to the 14 neutral periods, were the positions filtered seldom.
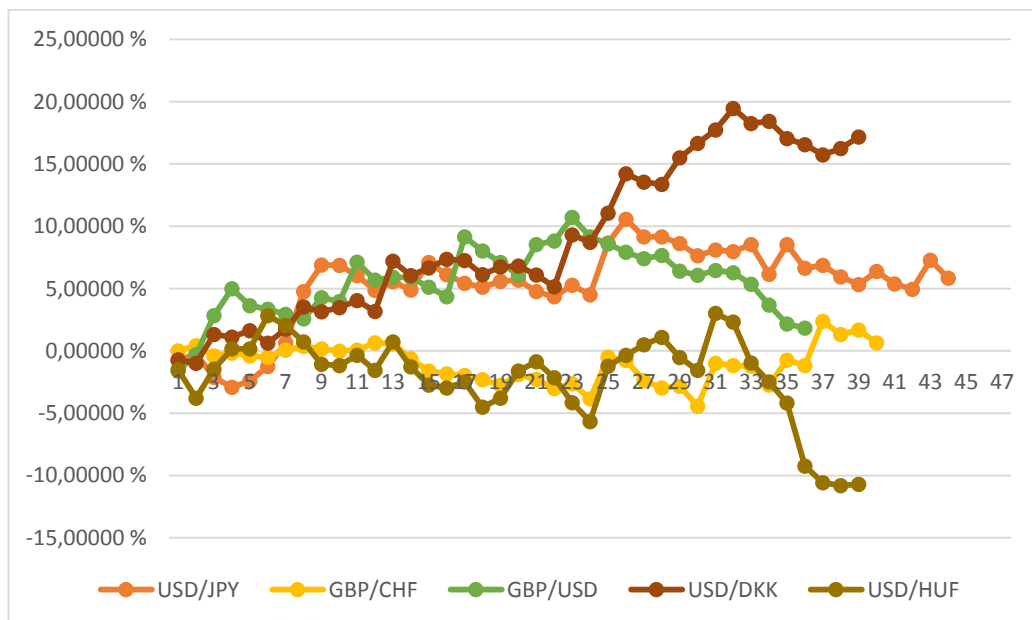
Chart 3. The cumulative log returns of the foreign exchange derivatives.

Like the chart 3 illustrates these five instruments gave some very different returns. The USD/DKK.CFD (dark brown line) was the best performing instrument of this portfolio. The instrument produced returns of 17,17%. The USD/JPY.CFD (orange line) was the most

traded instrument, and ended up with the second most positive returns with 5,84%. The GBP/USD.CFD´s returns were with 1,83% at the end of the five year period just a few percentage points above the returns of the GBP/CHF.CFD (yellow line) (-0,48%). The USD/HUF.CFD (brown line) ended with a cumulative return of 10,71% as the worst performing instrument of the foreign exchange derivatives.

4.3.1 The USD/JPY.CFD

The derivative instrument of the American dollar versus the Japanese yen was virtually 44 times traded. These trades consisted of 23 (52%) long positions and 21 (28%) short positions. At the end, the total of returns was 5,84%. The best performing trade produced a gain of 4,16% and the worst -2,40%. The 44 trades had an mean return of 0,13% and a standard deviation of 1,48%. During the first year the instrument produced 6 buy signals and 5 sell signals. The period was with a return of 6,05% relatively profitable. When looking at the chart the price was mainly under the 200-day moving average and was continuously making lower lows. Therefore the definition of a bear market holds and the long positions were to be filtered out. This gave us a return of 6,88%. During the period of 2005 the instrument was traded 8 times long and 2 times short, where the sum of the returns was -1,29%. The period was clearly bullish so filtering the positions gave us a return of 0,56%. In 2006 the chart indicated 12 signals, 6 long signals and 6 short signals. The return of these trades was 3,79%. During this period, the currency pair was in a sideways phase. The security was traded 8 times during the year 2010. These trades consisted of 3 long positions and 5 short positions. The return of these positions was -3,18% and long-filtered return -2,64%. During the year 2011 the instrument provided relatively little opportunity to trade. Only 3 clear patterns appeared on the chart which gave a return of 0,47%. These positions were traded into the direction of the bearish trend. All filtered returns together gave a total cumulative return of 9,06% which is a 3,22% point increase in performance. (Appendix 3)

4.3.2 The GBP/CHF.CFD

The CFD of the British pound against the Swiss franc was traded 40 times: 24 (60%) times on the long side and 16 (40%) times on the short side. These trades produced a return of -0,48%, of which the best trade´s return was 3,56% and worst trade´s return -1,60%. Hereby we have a mean return of 0,13% and a standard deviation of 1,48%. During the first period the 7 positions resulted a return of -1,06%. Referring to the phase of the trend, the 3 short positions were filtered, which led to a 0,08% performance. 2005 indicated 8 1-2-3 patterns on the chart. Only one of them was bearish and the rest was bullish. These positions had a performance of -1,67%. Since the trend was neutral, the positions were not filtered. The next year the instrument was traded again 8 times, 6 times bought and 2 times sold short.

These trades had as well a negative return of -1,03%. Here again the trend was neutral. In 2010 the 8 positions held gave some deviating returns, but produced overall a 1,64% return. Considering the trend was mostly bearish, it is reasonable to test if the filtered positions did any better: The 4 short positions had a return of 5,69%. 2011 the instrument gave according to the strategy 9 reasons to trade. 4 long positions and 5 short positions were traded. The return was 1,64%. This was again bearish year for the currency pair, so all long positions filtered out, we got a return of 3,54%.Considering that the original cumulative return of all trades was -0,48% and the return of the filtered positions 6,61%, we can again experience that the trend is a major factor when making trading decisions. (Appendix 3)

4.3.3   The GBP/USD.CFD

The derivative of the currency pair British pound against the US-dollar indicated 36 trading opportunities. 21 (58%) of them were long setups and 15 (42%) short. The trades produced a gain of 1,83% with a mean return of 0,05% and a standard deviation of 1,56%.

In 2002 the instrument was traded 7 times, 6 times long and 1 time short. The return was 2,93%. The year was bullish for the currency pair, so the 6 long positions alone gained a profit of 4,54%. Though in 2005 the instrument indicated for 6 short sells and only 1 long position, the trend was considered to be neutral. The return of these trades was 2,96%. During the next year, 7 signals were traded. 6 buy signals and 1 sell signals were identified. The return of these trades was 2,65%. The neutral state of the trend makes filtering incon-sistent. During the year 2010 the CFD was traded 6 times, 3 times long and 3 times short. These trades had a return of -1,15%. No filtering was needed here. In 2011 the instruments price action led to 9 trades: 5 long positions and 4 short positions. The weak signals led to a performance of -5,57%. Again the positions were not filtered. As the filtered returns were added up, the performance was 3,43% Which again was a relatively good increase in per-formance. (Appendix 3)

4.3.4   The USD/DKK.CFD

The US-dollar versus the Danish crown- currency pair derivative was the most positive re-turns giving instrument of the foreign exchange instruments. It led to 39 virtual trade execu-tions, of which 18 (46%) were long positions and 21 (54%) short positions.

All returns of this instrument gave a sum of 17,17%. Therefore the USD/DKK.CFD was the most profitable foreign exchange derivative. During the first trading period, the trades in-cluded no long positions but only 8 short positions. Hereby the trend was clearly bearish and no filtering was needed. These trades had a return of 3,53%. In 2005 the instrument was traded 8 times long and 3 times short. These 11 trades had a return of 3,20%. The trend was neutral during this period, so no trend filter was used. 2006 the instrument gave

6 signals of which 1 was a long- signal. These signals had a return of 4,32%, and according to the phase of the trend, we could filter the long position out, leaving a return of 4,92%. 2010 was a profitable year, where 7 trades resulted a performance of 8,39%. 4 of the positions were bullish and 3 bearish. The phase of the trend was neutral. Where 2010 was profitable, 2011 was more or less non-profitable. The return of the 5 long and 2 short positions was -2,28%. The trend did not show any signs in which direction the price is moving. With a filtered total return of 17,76%, the filtering did not lead to any significant performance increase in this case. (Appendix 3)

4.3.5 The USD/HUF.CFD

The USD/HUF is the quotation of the American dollar against the Hungarian forint. This instrument performed the worst, giving a return of -10,70%. The return was a result of 21 (54%) long positions and 18 (46%) short positions. The mean return of these positions was -0,28% and the standard deviation of the returns was 1,97%. During the first period the instrument indicated 6 signals: 5 sell signals and 1 buy signal. The return of these setups trades was 2,85%. Since the instrument was in a bear market, the return without the long position would be 5,15%. In 2005 the instrument gave 10 signals (7 buy and 3 sell signals). The returns of these signals was -5,81%. The trend was considered to be in a trendless phase, so filtering is not necessary. 2006 ensued 5 signals: 1 buy and 4 sell signals. The return of these trades was 2,11%. According to the table, the trend was neutral. In 2010 the instrument was traded 8 times with a total performance of 0,32%. 2010 was also a neutral year. The next year, the instrument gave some false break out signals, since the return was -10,17%. The instrument was still in a sideways market during this period. The filtered positions had a sum of -8,72% which is 1,98% points better than the non-filtered positions. (Appendix 3)

4.4 The commodity derivatives

The research included all tradable commodity derivatives on the WH Selfinvest-Brokers selection (excluding futures-CFD´s). The commodities included in the study were the GOLD.CFD (derivative of gold in us-dollars per ounce), the SILVER.CFD (derivative of silver in us-dollars per ounce) and the BRENT.CFD (derivative of crude oil brent per contract).

	GOLD	SILVER	BRENT
2002	Bullish	Neutral	
2005	Neutral	Neutral	
2006	Neutral	Neutral	
2010	Bullish	Neutral	Neutral
2011	Bullish	Neutral	Neutral

Table 4. The directions of the trends of the commodities instruments.

The chart 4 illustrates the phases of the trends of each instruments studied periods. With a ratio of 9/12 the commodities derivatives were mainly in a sideways market. Therefore the trend filter will only be used in the case of three periods.
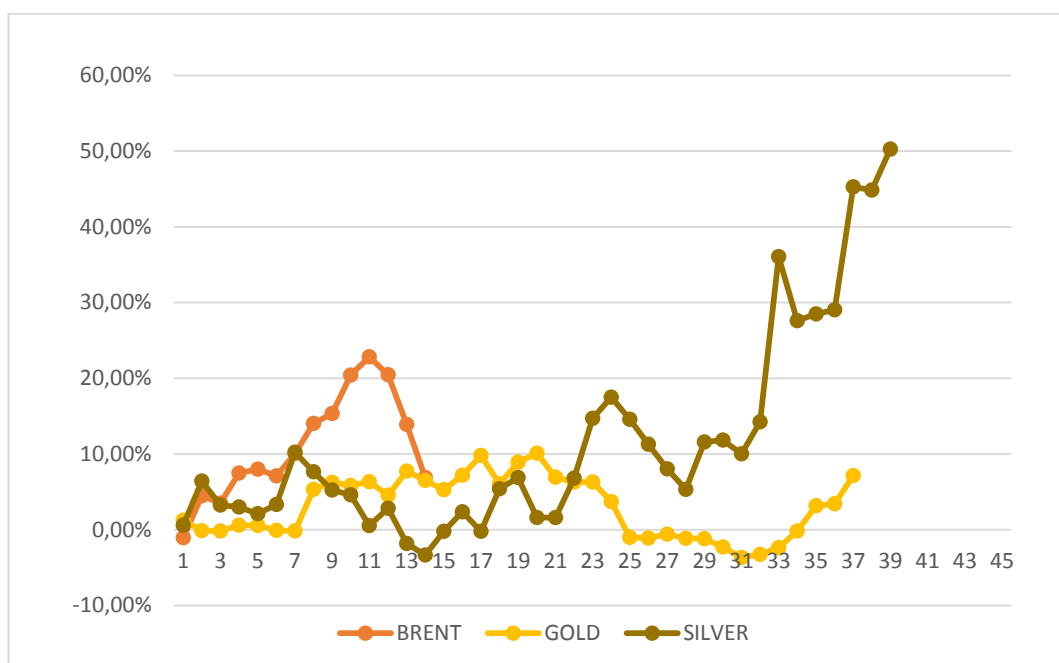
Chart 4: Cumulative Log Return of the Commodity Derivatives

Unfortunately the study could only include prices and positions of the BRENT.CFD from 2010 to 2011, since no older historical data was available on the trading platform. Therefore we have to look at the returns in relation to the quantity of observations. The BRENT.CFD (orange line) gave 14 signals during those two periods. In the chart above we can see that the instrument reached the best performance of 22,83% after the 10th trade. After this the slope of the returns decreased to 6,90%. The SILVER.CFD (brown line) was the best performing instrument of these three, ending at a cumulative return of 50,25%. The GOLD.CFD´s cumulative returns oscillate d mainly between a range of -5% to 10%.

4.4.1 The GOLD.CFD

The derivative of the gold commodity was tested with 37 virtual trades. 23 (62%) of them were long positions and 14 (38%) short. As these 37 trades had a return of 7,15% the mean return was 0,19% and standard deviation was 2,10%. The best performing trade had a return of 5,48% and the worst -4,71%. Thanks to the best performing trade in the first period, the return was a positive 5,31%. During this period 8 positions were traded, of which 5 were long positions and 3 short positions. Referring to chart 2. the GOLD-derivative was in a bullish trend during the first period, so by filtering the short positions out, we get a total return of 7,39%. In 2005, the instrument was traded 4 times on the long side and 4 times on the short side, giving a return of 1,89%. Gold was mainly above and below the 200 day moving average, so no positions were filtered. In 2006 the commodity gave 7 reasons to trade. These reasons consisted of 4 bullish and 3 bearish identified patterns. The return of this period was -0,90%. During 2010 the performance experienced another draw down, since the return was -8,58%. This return was a result of 5 long positions and 2 short positions. The trend was bullish so if we ignore the two short positions, the return would be -1,28%. In 2011 there were 7 identifiable signals on the chart. 5 of them were bullish and 2 of them were bearish. These trades, including the short positions had a return of 9,43%. Excluding the short positions it had a return of 2,39%. Where the original return of all the trades made with the GOLD.CFD- instrument were 7,15%, a filtered return of 9,49% gives us again a reason to pay attention to the trend. (Appendix 4)

4.4.2 The SILVER.CFD

Surprisingly the derivative of the silver commodity produced some very differentiating returns compared to gold. The total return of 39 virtual trades was 49,82%. Here the best performing trade had a return of 21,79% and worst -8,42% these trades may be areason why the standard deviation (5,62%) was relatively high. The mean return was on the contra relatively positive with 1,28%. According to the the trend filtering technique, all periods of the instrument were neutral so filtering in any period was irrelevant.   During the first period, the strategy experienced 5 trades of which 4 were long trades and 1 a short trade. The return of these trades was 2,12%. The next period, 2005, the derivative was traded 4 times long and 3 times short. These trades made a profit of 0,71%. In 2006 the instrument provided 10 signals. 9 of them were long positions. These position made a profit of 3,98%. 2010 the instrument made 9 clear 1-2-3 patterns, of which 5 were bullish and 4 bearish. These trades had a return of 3,23%. During the last period the instrument provided 8 opportunities to trade. 5 of these trades were long positions and 4 of them were short positions. This period was the most profitable period of the instrument, giving a return of 39,79%.

Since no period showed a clear trend for the silver commodity, the positions were not filtered. (Appendix 4)

4.4.3 The BRENT.CFD

Because the derivative instrument of the Crude Oil Brent was examined through 2 periods, it gave only 14 signals. These two periods were clearly neutral oriented. The returns deviated on average with 3,93% and had a mean return of 0,49%. Though the minimum return (-6,90%) was more negative than the most positive returns giving trade (5,51%) the total return of these two periods was 6,90%. The year 2010 was a positive year in terms of the trading. This period provided 7 buy signals and 1 sell signal. The return of these positions was 14,04%. The next year, the instrument was traded 6 times: 4 times bought and 2 times sold short. This period had a total return of -7,13%. (Appendix 4)

5   Analysis of the results

This chapter is referring continuously to the table 5 on the page 56, so it is important to explain what information each column includes. The purpose of the table is to provide a comprehensive overlook at the results, so that the different instruments can be compared easily. All cells filled whit a grey color are sums of the information above. Cells with a yellow paint include average numbers of the numbers above. Why some cells are sums and why some are averages, can be explained by the fact that for example different assets returns in percent are not additive.

The first column includes the list of the different instruments selected for this research. The second column "Bulls" is the amount of bullish periods the instrument had. It tells how many upward moving periods the instrument experienced according to the 200 day moving average concept. Each period is a one year period. On the other side of the coin, are the "Bears" which describe how many downward trending periods the instrument had. This information is in the third column. In the fourth column "Neutral", we have the amount of neutral or sideways moving trends. The "long" column, tells how many long or bullish trades each instrument had, and "short" tells how many short sells there where. The seventh column simply is the sum of the long and short positions. Now the eighth column "Avg. F." is the average frequency of the trades. This was calculated simply by counting the days between each position opening, adding them up and dividing with the number of trades made. Now that we have gone through the upper table, we move on to the lower table which has more complex numbers in it. Again the first column of the lower table has all instruments which we are examining listed. The next column "Max. Ret." tells how positive the best performing trade was. After that column we have the "Min. Ret", which includes the most negative return. "Mean Ret." includes the information of the average return. The equation 1 of the arithmetic mean, which can be found on the page 32 was used to compute this. So this number can also be held as the expected return of one trade. The next column includes the standard deviation of each instruments returns. In other words, it tells the dispersion of the returns. For further details, the reader should recall page 32, where standard deviation is explained more precisely (equation 3.). "CV" is the abbreviation for coefficient of variation, which is calculated in the next column (equation 5 on page 33). This ratio measures the mean return in relation to the standard deviation. In simple words: It measures the expected return in relation to the risk taken. Since the CV cannot be measured with negative numbers, the field which would include negative numbers have a simple "-" in them. The column of the "Sharpe R" has the Sharpe ratio calculated. Similar to the CV, this number measures the excess return in relation to risk. It would be recommended to turn back to page 34 to reread the section of the Sharpe ratio (equation 6.). The "Sum Log R." column includes the

sum of each instruments logarithmic returns. The ninth and final column includes the sum of the filtered returns. Like it was earlier emphasized, this is the sum of the returns, which were yielded through trades that were in the same direction with the trend. The table includes much information, but most of it does not provide any information to draw specific conclusions from. Therefore the focus will mainly be on the lower part of table 5.

Instrument	Bulls	Bears	Neutral	Long	Short	Total	Avg. F.
Indices							
DE30.CFD	3	1	1	28	13	41	37
UK100.CFD	2	1	2	29	20	49	32
US500.CFD	3	1	1	21	22	43	36
JP225.CFD	1	1	3	22	18	40	40
STOXX50.CFD	2	2	1	27	13	40	39
Stocks	11	6	8	127	86	213	36,80
CSCO.OQ.CFD	3	1	1	12	27	39	40
E.ON.CFD	2	1	2	25	17	42	35
WFC.N.CFD	3	1	1	23	24	47	33
LLOY.L.CFD	1	1	3	24	18	42	38
AEGN.AS.CFD	2	2	1	27	19	46	34
Forex	11	6	8	111	105	216	36,00
USD/JPY.CFD	1	3	1	23	21	44	35
GBP/CHF.CFD	0	3	2	24	16	40	41
GBP/USD.CFD	1	0	4	21	15	36	46
USD/DKK.CFD	0	2	3	18	21	39	42
USD/HUF.CFD	0	1	4	21	18	39	43
Commodities	2	9	14	107	91	198	41,40
GOLD.CFD	3	0	2	23	14	37	45
SILVER.CFD	0	0	5	27	12	39	43
BRENT.CFD	0	0	2	11	3	14	41
	3	0	9	61	29	90	43,00
	27	21	39	406	311	717	39,30

Instrument	Max. Ret.	Min. Ret.	Mean Ret.	Std. Dev.	CV	Sharpe R	Sum Log R.	Filtered R.
Indices								
DE30.CFD	22,04 %	-7,92 %	0,82 %	4,70 %	573,17 %	4,67	33,80 %	41,94 %
UK100.CFD	7,88 %	-3,78 %	-0,03 %	2,32 %	-	-5,66	-1,30 %	-1,79 %
US500.CFD	12,17 %	-4,78 %	0,39 %	2,90 %	743,59 %	1,65	16,60 %	24,56 %
JP225.CFD	9,33 %	-5,07 %	0,34 %	2,79 %	820,59 %	0,69	13,74 %	16,73 %
STOXX50.CFD	24,11 %	-3,55 %	1,30 %	4,64 %	356,92 %	8,7	52,13 %	54,80 %
Stocks	15,11 %	-5,02 %	0,56 %	3,47 %	623,57 %	2,01	22,99 %	27,25 %
CSCO.OQ.CFD	18,50 %	-7,68 %	0,80 %	4,38 %	545,49 %	2,21	31,30 %	33,07 %
E.ON.CFD	25,43 %	-5,88 %	0,25 %	4,98 %	1969,77 %	-0,24	10,61 %	14,73 %
WFC.N.CFD	27,12 %	-5,79 %	0,48 %	4,67 %	982,86 %	2,25	22,35 %	22,75 %
LLOY.L.CFD	12,18 %	-12,13 %	-0,40 %	4,40 %	-	-6,5	-16,78 %	-5,60 %
AEGN.AS.CFD	24,18 %	-6,25 %	0,18 %	4,56 %	2540,39 %	-0,78	8,26 %	8,26 %
Forex	21,48 %	-7,55 %	0,26 %	4,60 %	1509,63 %	-0,61	11,15 %	14,64 %
USD/JPY.CFD	4,16 %	-2,40 %	0,13 %	1,48 %	1114,93 %	-4,04	5,83 %	9,06 %
GBP/CHF.CFD	3,56 %	-1,60 %	-0,01 %	1,23 %	-	-9,99	-0,48 %	6,61 %
GBP/USD.CFD	4,82 %	-1,67 %	0,05 %	1,56 %	3068,31 %	-6,41	1,83 %	3,43 %
USD/DKK.CFD	4,16 %	-1,40 %	0,44 %	1,41 %	321,26 %	3,79	17,17 %	17,76 %
USD/HUF.CFD	4,57 %	-5,05 %	-0,27 %	1,97 %	-	-11,43	-10,71 %	-8,72 %
Commodities	4,25 %	-2,42 %	0,07 %	1,53 %	1501,50 %	-5,62	2,73 %	5,63 %
GOLD.CFD	5,48 %	-4,71 %	0,19 %	2,10 %	1086,55 %	-2,22	7,15 %	9,49 %
SILVER.CFD	21,78 %	-8,42 %	1,28 %	5,62 %	440,32 %	6,76	49,81 %	49,81 %
BRENT.CFD	5,51 %	-6,99 %	0,49 %	3,93 %	797,20 %	-1,25	6,90 %	6,90 %
	10,93 %	-6,71 %	0,65 %	3,89 %	774,69 %	1,10	21,29 %	22,07 %
	12,94 %	-5,42 %	0,39 %	3,37 %	1102,35 %	-78,03 %	14,54 %	17,40 %

██ = Sum

� = Average

Table 5. The results of the different instruments.

5.1 Maximum, minimum and mean returns

As we look into the second column of the chart we can easily see that the WFC.N.CFD had with 27,12% the highest return of all instruments and with -5,79% the most positive return of the stock instruments minimum returns. The E.ON had the second largest profit making trade with 25,43%. The third best performing trade was traded with the AEGN.AS.CFD which produced a profit of 24,18%. These three stock derivatives being the best performing stocks measured with the maximum return, the whole portfolio of the stock derivatives has also the highest average of all instrument portfolios maximum returns average. Therefore we have fortunately the mean return. As emphasized before, this number gives the average of all observations. If the sample is large enough and the observations are normally distributed, the mean can be assumed to be the expected outcome. As one goal of this thesis was to determine a market where the strategy works at its best, we will not rank the individual instruments but put the portfolios in a rank order.

The commodities had the largest mean return (0,65%). This is mainly due the high mean return of the SILVER.CFD, which ranks as the second instrument when looking at the sum of the returns. Since the study only included 3 different commodities derivatives, there were only 90 observations of these instruments. Therefore it is important to respect the validity of information by looking at the number of observations. The index-derivatives market for instance ranked as second, with its mean return of 0,56%. This market had 213 observations so the information of this portfolio can be held 2,37 times more valid than the information of the commodities portfolio. Fortunately the weighted arithmetic mean is a good way to measure the mean in respect of the number of observations. To do so we have to use the equation on page 39. By weighting every instruments mean return with the number of observations we can still rank the commodities portfolio as the best performing market in terms of the mean return. The weighted means are ranked as follows (the best first): Commodities (0,68%), indices (0,60%), stocks (0,28%) and forex (0,07%).

5.2   The standard deviation, coefficient of variation and Sharpe ratio

Since the standard deviation tells the observer how much the values tend to deviate from the mean, it is a good way to measure the riskiness of instruments.   The equation can be seen on the page 32. With an average standard deviation of 1,53% the foreign exchange market scored the best. Thus, this market would be the most risk averse market. The asset classes were ranked in terms of the mean standard deviation as follows (the best first): Foreign exchange (1,53%) ,indices (3,47%), commodities 3,89%) and stocks (4,60%).

The standard deviation does still not quite satisfy the determination of the best market to trade. In addition the coefficient of variation was calculated (equation 5. page 33).This number calculates the proportional relation of the arithmetic mean to the standard deviation. In other words, it determines the relative riskiness of an instrument. This way the instruments can be compared better. One finding of the research was that all instruments had a relatively CV. This means that the expected return of all assets is relatively small in proportion to the risk level. The instruments which had negative mean returns could not be taken into account, since the CV can only take numbers which are on ratio scale. Hence, numbers that are larger than or equal to zero. Comparing the mean CV´s of the markets could be ranked as follows (the best fist): Indices (623,57%), commodities (774,69%), foreign exchange (1501,50%) and stocks (1509,63%). In addition to the CV, the Sharpe ratio was calculated. The concept of this ratio can be seen on page 34. This number is similar to the CV as it compares the expected returns to the standard deviation. But here the expected returns are assumed to be the risk free returns of the investment subtracted from the investments returns. The CV can then be calculated by dividing the excess returns with the standard deviation of the returns. This gives us an excellent key figure to evaluate each instruments return, as it compares the instruments returns to other instruments returns. As usually, here are also the U.S. Government backed debt obligations used as the proportional risk free instrument. This instrument produced a cumulative gain of 11,81% during the five-year period. According to the Sharpe ratio, only two markets of the sample had a positive ratio: the indices with a mean Sharpe ratio of 2,01 and the commodities with a mean Sharpe ratio of 1,1. The other two asset classes had mean ratios of -0,61 (stocks) and -5,62 (foreign exchange). This is because the returns of these instruments were mainly below the returns of the comparable assets 5-year return (11,81%). Therefore the index and commodities derivatives scored again as the best instruments to trade with of the sample. (U.S. Department of the Treasury 2014)

6 Drawing conclusions

We can see in the previous chapters that all the instruments included in the research produced some various returns. Therefore it is clear that the break out strategy does not work the same way in all markets. By simply looking at the charts with the cumulative returns, we can notice some behavior. Especially the stock derivatives performance is highly dependent on trades with abnormal returns. In these cases the cumulative return jumps to a higher level. Therefore the instruments would not produce any significant gains without these abnormal returns. That is what the strategy is basically aiming for: Indicating signals that will predict some decent order volume, hence price movement.

The "Sum Log R." stands for the sum of the logarithmic returns. In this column we can see that the mean cumulative logarithmic returns of the commodities derivatives (21,29%) were only 1,70% points below the mean logarithmic returns of the index derivatives (22,99%). The index derivatives returns responded also the most to filtering the positions: The difference between the non-filtered and filtered returns is 4,26% points. So recalling the main research problem: "Can a technical analysis based trading strategy produce continuously positive returns?" We can cautiously answer yes, but we have to keep in mind that this research examined only 18 different instruments from four different markets. Different instruments tend to give very different returns through time. I think this is also a good point to refer to the question 7 of the questionnaire (Do you think one can continuously gain positive returns by applying pure technical analysis to investment decisions?) Where the investment strategist answered: "No, at least not by using one constant "formula" over time. Different approaches work in different times and markets. The hard part is to detect when change comes and find a new approach that will work." (Appendix 5) The answer by the strategist suggests that one specific concept may not be valid forever. This research was done using historical data and the problem is that the strategy may not work the same way in the future. But as the concept behind technical analysis is based on the three cornerstones which were introduced in the second chapter, the third assumption should be taken into account: "history tends to repeat itself". Therefore a technical analyst should assume that, if the strategy has worked in the past, it should also work in the future. The second respondent answered to the same question "It depends on how it is done, but generally speaking yes". This answer implies almost the same what the first respondent answer did: It can work, but it depends on the method. "We can also formulate the research question by changing the word "positive" to "superior". This alters the significance as it now and questions whether technical analysis can help one to beat the market. Meaning that, will it lead to higher returns than for example an index or bond yields? According to the research results we can again answer carefully yes. At least to some extent, since only two asset classes beat the treasury bills

returns on average. Therefore the Sharpe ratio is a valuable measure of performance, because it tells one whether the strategy is leading to better returns than the market.

The main interest of the trader lies of course on the total return, but when choosing the market where the strategy works we have to take all determinants into account: The maximum possible return, the minimum possible return, the average return, the instability, the coefficient of variation, the Sharpe ratio and the total return. This leads to the chart 6 below.

Asset Class Mean	Max. Ret.	Min. Ret.	Mean Ret.	Std. Dev.	CV	Sharpe R	Sum Log R.	Filtered R.
Indices	15,11 %	-5,02 %	0,56 %	3,47 %	623,57 %	2,01	22,99 %	27,25 %
Stocks	21,48 %	-7,55 %	0,26 %	4,60 %	1509,63 %	-0,61	11,15 %	14,64 %
Foreign exchange	4,25 %	-2,42 %	0,07 %	1,53 %	1501,50 %	-5,62	2,73 %	5,63 %
Commodities	10,93 %	-6,71 %	0,65 %	3,89 %	774,69 %	1,10	21,29 %	22,07 %

Table 6. Every asset classes mean key figures.

Picking the best score in every asset class, the index derivatives got the most selected class. It got four times the best determinant, and therefore is the best market to implement this strategy in. If one wants to trade several asset classes the next choice would be to trade the commodities market. This group had the best mean return and the second best CV, Sharpe ratio and cumulative return. This answers the second research question: "In which markets does the technical analysis based strategy work?".

When it comes to determining the most favorable trend or economic cycle to trade this strategy in, we have three different types of markets to examine: the bull market, the bear market and the neutral or sideways market. These markets where determined on every sample instrument by the 200 day moving average concept. If the price had been more than 90% of the time (1,2 months or 25 days if there are 252 trading days) above the 200 day moving average, the trend was assumed to be bullish and vice versa. However if the price was not 90% of the time above nor below the line, the instrument was in a sideways market. Therefore we have three types of markets which we want to examine. The performance of the strategy in these markets was tested in three steps: first the markets where determined, then calculated if these periods had a positive return and from this then calculated in which markets these periods had positive returns.

First the bull market periods were given a number 1 and every other period a 0.
Then each period which had a positive cumulative return was also a number 1 given. Thus, we got two tables with a series of 1´s and 0´s. These tables were then multiplied with each other and the sum of the product table then told in how many periods the strategy produced positive returns.. This was done with each different market, always giving the observed market a 1 and the rest 0´s. In mathematical terms this could be written as:

Equation 7. Probability of a positive return during a bullish period

$$\rho_{bullish} = \frac{\sum(p_r)(t_u)}{n_{bullish}}$$

Equation 8. Probability of a positive return during a bearish period

$$\rho_{bearish} = \frac{\sum(p_r)(t_d)}{n_{bearish}}$$

Equation 9. Probability of a positive return during a neutral period

$$\rho_{neutral} = \frac{\sum(p_r)(t_s)}{n_{neutral}}$$

Where in every equation (7, 8 and 9) ρ stands for the probability of the trend to yield positive returns, p_r for the profitable period (if sum of returns > 0 then 1), t_u for up trend (if bullish period then = 1), t_d for a down trend (if bearish period then = 1), t_s for a sideways trend (if neutral period then 1) and n for the total amount of the respective markets periods. We got a sum of 25 bullish periods, 21 bearish periods and 39 neutral periods. That makes 85 periods altogether.

	Bullish		Bearish		Neutral
	Non-filtered	Filtered	Non-filtered	Filtered	Non-filtered
Indices	90,00 %	80,00 %	66,67 %	83,33 %	75,00 %
Stocks	60,00 %	60,00 %	57,14 %	71,43 %	42,86 %
Foreign exchange	50,00 %	100,00 %	77,78 %	88,89 %	50,00 %
Commodities	66,67 %	66,67 %	-	-	77,78 %

	Bullish		Bearish		Neutral
	Non-filtered	Filtered	Non-filtered	Filtered	Non-filtered
Overall profitability	72,00 %	72,00 %	68,18 %	81,82 %	60,53 %

Table 7. The sample probabilities of different trends to produce positive returns.

The upper chart shows the sample probability that the certain asset class will lead to a positive return in the specific phase of the trend. The lower chart is the overall probability of the strategy to produce positive returns in the three different trends. According to the table 7 above 90% of the index derivatives trades yielded to higher returns than zero in the bull market phase. 66,67% of the trades made in the bear market led to positive returns and 75% of the trades made in the sideways market led to positive returns and so on. If we compare the "non-filtered" and "filtered" columns, we can see that the trades made into the

direction of the trend led almost in every case to a better return. It should be paid attention to the fact that the foreign exchange market had only two bull market periods which had positive returns and therefore both filtered periods led to a 100% probability to yield a positive return. To my surprise the results of the different trends did not differ significantly from each other: 72% of the trades in the bull market lead to positive returns, 68,18% of the trades in the bear market lead to positive returns and 60,53% of the positions held in the neutral market phase led to positive returns. However if one wants a specific trend direction in which the strategy works at its best, the bullish trend is preferable. Nevertheless the chart can be a bit misleading: The percentage of trades which leads to positive returns in each trend does not equal profitability. Hence, if 72% of the overall bull market positions led to positive return, could the 28% (negative returns) basically have led to a negative total return, since all returns equal or higher than 0% were counted as positive returns.

6.1 Reflections

This research based thesis was executed to provide information about technical analysis of the financial markets. Moreover this paper was written, to find out whether technical analysis can be used to gain continuously positive returns. I chose the subject due to my own interests and future outlooks. Before writing the thesis I was familiar with different kinds of technical analysis based investment strategies. I had read plenty of books about the subject. None of them really tested the strategies and suggested any specific market or instrument to trade. As my goal is to become a professional technical analyst someday, I was enthusiastic to write this thesis.

During the research I first of all learned how to test a trading strategy. The research was executed by studying theories of technical analysis, then choosing a strategy, then testing and evaluating the strategy. Basically the whole process of a strategy implementation was walked through. In addition it gave me ideas of how to examine in which markets and with which instruments the strategy works at its best. More specifically, the research taught me how to calculate different kinds of figures and how to use them to evaluate the profitability, riskiness and expected returns. Most of the quantitative methods learned in the Haaga - Helia University of Applied Sciences were now used in practice. The research reminded me that it is essential to stay as subjective as possible. Hence, cheating on the results will not bring any benefit for anyone. Or despite I believe in the art of technical analysis, praising the theories would have been unprofessional. Therefore I wanted to bring out also some criticism against the subject. Moreover this research taught me about using different sources and how to evaluate the validness of information. All things considered the thesis

brought a lot of positive benefits for me. One of the most important one is that this thesis woke my interest even more to keep studying the field of technical analysis.

6.2   Suggestions for further research

During the research many new ideas came to my mind. These ideas were basically concepts of how to enhance the strategy. Still the next step of this research would be an expansion of the observations into the intraday trading range. What is called "day trading", opens a whole new world to study. Basically this strategy could be tested from timescales of 5 minutes to 8 hour charts. To wake the interest of intraday trading even more, I want to refer to the question 11. answered by the investment strategist. (Appendix 5) "The shorter your timeframe, the more important it (technical analysis) is. Day trading is mostly technical". This means that the answerer of the questionnaire thinks that technical analysis works the best on intraday trading. Therefore applying the strategy to day trading, may lead to even larger positive returns. Since many traders use a combination of fundamental and technical analysis, it would be interesting to combine the break out strategy with news trading for example. One could measure returns from news releases which work in the same direction as the 1-2-3 pattern in place. This could lead to very strong signals. The wide selection of available indicators open also many possibilities to enhance this strategy with. Adapting indicators such as volume, moving average convergence divergence or any other to this strategy could also lead to significant increases in performance.

Bibliography

Berk, J., DeMarzo, P. *Corporate Finance,* 3rd edition. Pearson Education

Brooks, A. 2011, *Trading Price Action Trends: Technical Analysis of Price Charts Bar by Bar for the Serious Trader.* Wiley

Burton, G. Carrol, G. & Wall, S. 2002, *Quantitative Methods for Business & Economics, 2nd edition.* Prentice Hall

Defusco, A., McLeavey, D. W., Pinto, J. E. & Runkle, D.E. 2007, *Quantitative Investment Analysis .* Wiley

Hull, J. C. 2012 *Options, Futures And Other Derivatives.* Pearson Education.

Morris, G. L. 2014 *Investing With the Trend: A Rules-Based Approach to Money Management.* Bloomberg Press. Wiley

Murphy, J.J. 2010 *Technical Analysis of the Financial Markets* 7th edition. new York Institute of Finance

Nison, S., 2011 *Japanese Candlestick Charting Techniques: A Contemporary Guide to the Ancient Investment Techniques of the far East 2nd edition.* 2nd edition. Prentice Hall

Riße, S. 2005 CFDs simplified. Finanzbuch Verlag

Voigt, M. 2013 *Das große Buch der Markttechnik: Auf der Suche nach der Qualität im Trading, 9th edition.* Finanzbuch Verlag

Figure 5, 6, and 7 (charts) https://www.prorealtime.com/en/ pro realtime - software

All other charts are form the WHSelfinvest-brokers WHSprostation software
http://www.whselfinvest.de/

U.S. Department of the Treasury/ Resource Center/ Historical Treasury Rates
http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/Historic-
    LongTerm-Rate-Data-Visualization.aspx. Accessed 10.10.2014

Appendices

Appendix 1 The return tables of the index derivatives

#	Instrument	Date	Buy/Se	Opening pric	Closing price	Ret	LogRet
1	DE30.CFD	5.2.2002	SELL	4975,50	4984,00	-0,17055 %	-0,17069 %
2	DE30.CFD	20.2.2002	SELL	4726,00	4870,60	-2,96883 %	-3,01380 %
3	DE30.CFD	25.4.2002	SELL	5126,70	5024,40	2,03606 %	2,01561 %
4	DE30.CFD	30.5.2002	SELL	4771,30	4468,10	6,78588 %	6,56555 %
5	DE30.CFD	5.7.2002	BUY	4445,50	4191,10	-5,72264 %	-5,89291 %
6	DE30.CFD	6.8.2002	SELL	3266,90	3536,20	-7,61552 %	-7,92112 %
7	DE30.CFD	18.9.2002	SELL	3230,90	2927,10	10,37887 %	9,87486 %
8	DE30.CFD	4.11.2002	BUY	3297,70	3165,20	-4,01795 %	-4,10090 %
9	DE30.CFD	4.2.2005	BUY	4326,80	4368,70	0,96838 %	0,96372 %
10	DE30.CFD	4.3.2005	BUY	4409,50	4376,00	-0,75972 %	-0,76262 %
11	DE30.CFD	15.4.2005	SELL	4275,00	4210,70	1,52706 %	1,51552 %
12	DE30.CFD	6.7.2005	BUY	4638,10	4577,60	-1,30441 %	-1,31300 %
13	DE30.CFD	11.7.2005	BUY	4638,10	4877,00	5,15082 %	5,02255 %
14	DE30.CFD	10.8.2005	BUY	4934,50	4882,90	-1,04570 %	-1,05120 %
15	DE30.CFD	7.9.2005	BUY	4990,10	4979,90	-0,20440 %	-0,20461 %
16	DE30.CFD	28.9.2005	BUY	5036,40	5050,60	0,28195 %	0,28155 %
17	DE30.CFD	26.1.2006	BUY	5561,80	5643,10	1,46176 %	1,45118 %
18	DE30.CFD	13.2.2006	BUY	5759,60	5869,50	1,90812 %	1,89014 %
19	DE30.CFD	17.3.2006	BUY	5915,50	5866,00	-0,83678 %	-0,84031 %
20	DE30.CFD	20.4.2006	BUY	6048,40	6066,40	0,29760 %	0,29716 %
21	DE30.CFD	6.6.2006	SELL	5514,70	5481,30	0,60934 %	0,60750 %
22	DE30.CFD	14.9.2006	BUY	5917,10	5874,20	-0,72502 %	-0,72766 %
23	DE30.CFD	1.11.2006	BUY	6311,90	6365,70	0,85236 %	0,84875 %
24	DE30.CFD	13.12.2006	BUY	6493,10	6499,80	0,10319 %	0,10313 %
25	DE30.CFD	2.2.2010	BUY	5756,00	5929,10	3,00730 %	2,96296 %
26	DE30.CFD	4.2.2010	SELL	5535,10	5549,90	-0,26667 %	-0,26703 %
27	DE30.CFD	14.6.2010	BUY	6115,00	6166,30	0,83892 %	0,83542 %
28	DE30.CFD	2.8.2010	BUY	6256,00	6266,40	0,16624 %	0,16610 %
29	DE30.CFD	13.10.2010	BUY	6341,50	6614,20	4,30024 %	4,21035 %
30	DE30.CFD	1.12.2010	BUY	6900,40	6973,60	1,06081 %	1,05522 %
31	DE30.CFD	12.1.2011	BUY	7085,80	7065,40	-0,28790 %	-0,28831 %
32	DE30.CFD	27.1.2011	BUY	7172,30	7044,40	-1,78325 %	-1,79934 %
33	DE30.CFD	8.3.2011	SELL	7079,70	6825,40	3,72579 %	3,65806 %
34	DE30.CFD	20.4.2011	BUY	7242,30	7428,40	2,56963 %	2,53717 %
35	DE30.CFD	16.5.2011	SELL	7290,50	7332,80	-0,57686 %	-0,57853 %
36	DE30.CFD	29.6.2011	BUY	7309,50	7396,20	1,18613 %	1,17915 %
37	DE30.CFD	1.8.2011	SELL	6987,70	5605,80	24,65125 %	22,03497 %
38	DE30.CFD	27.9.2011	BUY	5663,40	5250,20	-7,29597 %	-7,57582 %
39	DE30.CFD	7.10.2011	BUY	5704,10	5771,80	1,18687 %	1,17988 %
40	DE30.CFD	25.10.2011	BUY	6083,40	5947,90	-2,22737 %	-2,25255 %
41	DE30.CFD	9.11.2011	SELL	5758,30	5683,70	1,31253 %	1,30399 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	UK100.CFD	30.1.2002	SELL	5080,60	5132,70	-1,01506 %	-1,02025 %
2	UK100.CFD	20.2.2002	SELL	5038,70	5092,90	-1,06423 %	-1,06993 %
3	UK100.CFD	8.4.2002	SELL	5169,60	5259,50	-1,70929 %	-1,72406 %
4	UK100.CFD	28.5.2002	SELL	5081,60	5083,50	-0,03738 %	-0,03738 %
5	UK100.CFD	3.7.2002	SELL	4444,20	4615,60	-3,71349 %	-3,78420 %
6	UK100.CFD	11.7.2002	SELL	4392,20	4298,30	2,18458 %	2,16106 %
7	UK100.CFD	9.8.2002	BUY	4308,30	4283,20	-0,58260 %	-0,58430 %
8	UK100.CFD	18.9.2002	SELL	3918,50	3899,30	0,49240 %	0,49119 %
9	UK100.CFD	14.10.2002	BUY	3963,40	4003,40	1,00923 %	1,00418 %
10	UK100.CFD	21.11.2002	BUY	4198,20	4067,40	-3,11562 %	-3,16519 %
11	UK100.CFD	31.1.2005	BUY	4863,10	4897,60	0,70942 %	0,70692 %
12	UK100.CFD	10.2.2005	SELL	4966,00	4999,40	-0,66808 %	-0,67032 %
13	UK100.CFD	16.3.2005	SELL	4966,90	4942,90	0,48554 %	0,48437 %
14	UK100.CFD	18.4.2005	SELL	4877,50	4860,50	0,34976 %	0,34915 %
15	UK100.CFD	18.5.2005	BUY	4929,10	4961,90	0,66544 %	0,66323 %
16	UK100.CFD	30.6.2005	BUY	5121,30	5190,30	1,34731 %	1,33832 %
17	UK100.CFD	29.7.2005	BUY	5282,20	5345,80	1,20404 %	1,19685 %
18	UK100.CFD	15.9.2005	BUY	5386,10	5375,00	-0,20609 %	-0,20630 %
19	UK100.CFD	7.12.2005	BUY	5555,80	5497,10	-1,05655 %	-1,06217 %
20	UK100.CFD	21.12.2005	BUY	5574,00	5621,10	0,84499 %	0,84144 %
21	UK100.CFD	27.1.2006	BUY	5751,20	5745,80	-0,09389 %	-0,09394 %
22	UK100.CFD	14.2.2006	BUY	5816,50	5822,50	0,10315 %	0,10310 %
23	UK100.CFD	6.3.2006	BUY	5893,00	5803,90	-1,51196 %	-1,52351 %
24	UK100.CFD	13.3.2006	BUY	5924,10	5992,80	1,15967 %	1,15300 %
25	UK100.CFD	5.4.2006	BUY	6047,80	6016,40	-0,51920 %	-0,52055 %
26	UK100.CFD	19.4.2006	BUY	6092,10	6073,40	-0,30695 %	-0,30743 %
27	UK100.CFD	12.5.2006	SELL	6000,10	5657,70	6,05193 %	5,87587 %
28	UK100.CFD	13.6.2006	SELL	5509,90	5666,20	-2,75846 %	-2,79722 %
29	UK100.CFD	27.7.2006	BUY	5908,20	5876,90	-0,52977 %	-0,53118 %
30	UK100.CFD	4.9.2006	BUY	5982,20	5928,70	-0,89432 %	-0,89834 %
31	UK100.CFD	29.9.2006	BUY	5991,60	6138,80	2,45677 %	2,42708 %
32	UK100.CFD	7.11.2006	BUY	6243,20	6142,80	-1,60815 %	-1,62122 %
33	UK100.CFD	4.2.2010	SELL	5123,30	5120,30	0,05859 %	0,05857 %
34	UK100.CFD	5.3.2010	BUY	5600,50	5598,10	-0,04285 %	-0,04286 %
35	UK100.CFD	15.6.2010	BUY	5263,80	5139,00	-2,37091 %	-2,39947 %
36	UK100.CFD	3.9.2010	BUY	5427,60	5726,60	5,50888 %	5,36249 %
37	UK100.CFD	14.12.2010	BUY	5899,70	5967,00	1,14074 %	1,13428 %
38	UK100.CFD	28.1.2011	SELL	5861,50	6005,50	-2,39780 %	-2,42702 %
39	UK100.CFD	10.3.2011	SELL	5852,70	5775,60	1,33493 %	1,32609 %
40	UK100.CFD	26.4.2011	BUY	6071,20	5999,20	-1,18593 %	-1,19302 %
41	UK100.CFD	16.5.2011	SELL	5871,60	5953,70	-1,37897 %	-1,38857 %
42	UK100.CFD	23.5.2011	SELL	5847,40	5948,90	-1,70620 %	-1,72092 %
43	UK100.CFD	28.6.2011	BUY	5791,90	6004,10	3,66374 %	3,59822 %
49	UK100.CFD	22.7.2011	BUY	5302,50	5236,10	-1,25224 %	-1,26015 %
44	UK100.CFD	2.8.2011	SELL	5730,90	5296,70	8,19756 %	7,87886 %
45	UK100.CFD	31.8.2011	BUY	5399,20	5202,70	-3,63943 %	-3,70731 %
46	UK100.CFD	4.10.2011	SELL	4927,50	5115,50	-3,67511 %	-3,74434 %
47	UK100.CFD	24.10.2011	BUY	5542,80	5461,60	-1,46496 %	-1,47580 %
48	UK100.CFD	10.11.2011	SELL	5333,70	5252,50	1,54593 %	1,53410 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	US500.CF	20.2.2002	SELL	1 077,70 €	1 109,60 €	-2,87491 %	-2,91704 %
2	US500.CF	23.4.2002	SELL	1 099,40 €	1 094,20 €	0,47523 %	0,47411 %
3	US500.CF	6.5.2002	SELL	1 063,40 €	1 059,10 €	0,40601 %	0,40518 %
4	US500.CF	3.6.2002	SELL	1 048,80 €	1 033,20 €	1,50987 %	1,49859 %
5	US500.CF	24.6.2002	SELL	981,10 €	1 002,30 €	-2,11514 %	-2,13782 %
6	US500.CF	2.7.2002	SELL	953,50 €	989,00 €	-3,58948 %	-3,65549 %
7	US500.CF	10.7.2002	SELL	935,00 €	827,90 €	12,93634 %	12,16542 %
8	US500.CF	9.8.2002	BUY	913,10 €	918,10 €	0,54759 %	0,54609 %
9	US500.CF	17.9.2002	SELL	871,00 €	834,00 €	4,43645 %	4,34086 %
10	US500.CF	21.11.2002	BUY	925,40 €	914,00 €	-1,23190 %	-1,23955 %
11	US500.CF	20.1.2005	SELL	1 175,80 €	1 173,10 €	0,23016 %	0,22989 %
12	US500.CF	1.3.2005	BUY	1 212,20 €	1 222,20 €	0,82495 %	0,82156 %
13	US500.CF	14.4.2005	SELL	1 163,80 €	1 155,50 €	0,71830 %	0,71574 %
14	US500.CF	18.5.2005	BUY	1 178,90 €	1 184,90 €	0,50895 %	0,50766 %
15	US500.CF	11.7.2005	BUY	1 219,40 €	1 223,30 €	0,31983 %	0,31932 %
16	US500.CF	16.8.2005	SELL	1 222,70 €	1 222,70 €	0,00000 %	0,00000 %
17	US500.CF	5.10.2005	SELL	1 205,40 €	1 179,70 €	2,17852 %	2,15513 %
18	US500.CF	6.12.2005	BUY	1 270,80 €	1 258,00 €	-1,00724 %	-1,01235 %
19	US500.CF	7.2.2006	SELL	1 259,40 €	1 265,60 €	-0,48989 %	-0,49109 %
20	US500.CF	14.3.2006	BUY	1 297,10 €	1 297,10 €	0,00000 %	0,00000 %
21	US500.CF	20.4.2006	BUY	1 313,80 €	1 306,30 €	-0,57086 %	-0,57250 %
22	US500.CF	12.6.2006	SELL	1 245,50 €	1 254,90 €	-0,74906 %	-0,75188 %
23	US500.CF	4.8.2006	BUY	1 287,60 €	1 274,00 €	-1,05623 %	-1,06185 %
24	US500.CF	16.8.2006	BUY	1 292,70 €	1 295,50 €	0,21660 %	0,21637 %
25	US500.CF	28.8.2006	BUY	1 303,30 €	1 309,10 €	0,44502 %	0,44404 %
26	US500.CF	13.9.2006	BUY	1 314,70 €	1 312,80 €	-0,14452 %	-0,14462 %
27	US500.CF	9.11.2006	BUY	1 389,10 €	1 391,70 €	0,18717 %	0,18700 %
28	US500.CF	4.12.2006	BUY	1 408,00 €	1 405,80 €	-0,15625 %	-0,15637 %
29	US500.CF	12.3.2010	BUY	1 151,50 €	1 168,30 €	1,45897 %	1,44843 %
30	US500.CF	21.5.2010	SELL	1 059,40 €	1 086,10 €	-2,45834 %	-2,48906 %
31	US500.CF	29.6.2010	SELL	1 038,80 €	1 048,00 €	-0,87786 %	-0,88174 %
32	US500.CF	17.9.2010	BUY	1 130,40 €	1 164,70 €	3,03432 %	2,98920 %
33	US500.CF	3.12.2010	BUY	1 228,00 €	1 254,10 €	2,12541 %	2,10314 %
34	US500.CF	27.1.2011	BUY	1 300,60 €	1 280,50 €	-1,54544 %	-1,55751 %
35	US500.CF	1.2.2011	BUY	1 299,80 €	1 336,90 €	2,85429 %	2,81431 %
36	US500.CF	10.2.2011	SELL	1 293,90 €	1 293,30 €	0,04639 %	0,04638 %
37	US500.CF	21.4.2011	BUY	1 340,70 €	1 350,90 €	0,76080 %	0,75792 %
38	US500.CF	16.5.2011	SELL	1 328,80 €	1 331,50 €	-0,20278 %	-0,20298 %
39	US500.CF	29.7.2011	SELL	1 296,00 €	1 198,20 €	8,16224 %	7,84622 %
40	US500.CF	29.8.2011	BUY	1 209,50 €	1 171,30 €	-3,15833 %	-3,20928 %
41	US500.CF	12.9.2011	SELL	1 137,40 €	1 172,40 €	-2,98533 %	-3,03080 %
42	US500.CF	3.10.2011	SELL	1 108,90 €	1 163,20 €	-4,66816 %	-4,78063 %
43	US500.CF	17.11.2011	SELL	1 221,80 €	1 175,60 €	3,92991 %	3,85465 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	JP225.CFD	16.1.2002	SELL	10171,00	10295,00	-1,20447 %	-1,21178 %
2	JP225.CFD	21.2.2002	BUY	10243,00	10583,00	3,31934 %	3,26544 %
3	JP225.CFD	22.3.2002	SELL	11349,00	11382,00	-0,28993 %	-0,29035 %
4	JP225.CFD	17.5.2002	BUY	11813,00	11794,00	-0,16084 %	-0,16097 %
5	JP225.CFD	22.7.2002	SELL	10059,00	10145,00	-0,84771 %	-0,85132 %
6	JP225.CFD	26.8.2002	BUY	10046,00	9549,00	-4,94724 %	-5,07381 %
7	JP225.CFD	3.10.2002	SELL	8967,00	8489,00	5,63082 %	5,47800 %
8	JP225.CFD	11.11.2002	SELL	8502,00	8502,00	0,00000 %	0,00000 %
9	JP225.CFD	10.2.2005	BUY	11585,00	11600,00	0,12948 %	0,12939 %
10	JP225.CFD	28.2.2005	BUY	11688,00	11792,00	0,88980 %	0,88587 %
11	JP225.CFD	14.4.2005	SELL	11507,00	11103,00	3,63866 %	3,57402 %
12	JP225.CFD	13.6.2005	BUY	11375,00	11463,00	0,77363 %	0,77065 %
13	JP225.CFD	29.6.2005	BUY	11577,00	11548,00	-0,25050 %	-0,25081 %
14	JP225.CFD	11.7.2005	BUY	11678,00	11667,00	-0,09419 %	-0,09424 %
15	JP225.CFD	28.7.2005	BUY	11864,00	11854,00	-0,08429 %	-0,08432 %
16	JP225.CFD	5.9.2005	BUY	12612,00	12581,00	-0,24580 %	-0,24610 %
17	JP225.CFD	9.9.2005	BUY	12581,00	13108,00	4,18886 %	4,10350 %
18	JP225.CFD	19.10.2005	SELL	13217,00	13395,00	-1,32885 %	-1,33776 %
19	JP225.CFD	1.11.2005	BUY	13779,00	13974,00	1,41520 %	1,40528 %
20	JP225.CFD	21.12.2005	BUY	15886,00	16026,00	0,88128 %	0,87742 %
21	JP225.CFD	13.3.2006	BUY	16297,00	16239,00	-0,35589 %	-0,35653 %
22	JP225.CFD	31.5.2006	SELL	15509,00	15788,00	-1,76716 %	-1,78297 %
23	JP225.CFD	14.8.2006	BUY	15714,00	15961,00	1,57185 %	1,55962 %
24	JP225.CFD	4.9.2006	BUY	16232,00	16018,00	-1,31838 %	-1,32715 %
25	JP225.CFD	15.12.2006	BUY	16898,00	16772,00	-0,74565 %	-0,74844 %
26	JP225.CFD	4.2.2010	SELL	10101,00	10167,00	-0,64916 %	-0,65128 %
27	JP225.CFD	5.3.2010	BUY	10446,00	10512,00	0,63182 %	0,62983 %
28	JP225.CFD	4.5.2010	SELL	10758,00	9800,00	9,77551 %	9,32673 %
29	JP225.CFD	15.6.2010	BUY	9997,00	9959,00	-0,38011 %	-0,38084 %
30	JP225.CFD	11.8.2010	SELL	9160,00	9078,00	0,90328 %	0,89923 %
31	JP225.CFD	29.10.2010	SELL	9255,00	9327,00	-0,77195 %	-0,77495 %
32	JP225.CFD	5.1.2011	BUY	10395,00	10460,00	0,62530 %	0,62335 %
33	JP225.CFD	14.2.2011	BUY	10623,00	10610,00	-0,12238 %	-0,12245 %
34	JP225.CFD	10.3.2011	SELL	10323,00	9544,00	8,16220 %	7,84617 %
35	JP225.CFD	28.4.2011	BUY	9831,00	9924,00	0,94599 %	0,94154 %
36	JP225.CFD	29.7.2011	SELL	9777,00	9912,00	-1,36199 %	-1,37135 %
37	JP225.CFD	19.8.2011	SELL	8646,00	8948,00	-3,37506 %	-3,43333 %
38	JP225.CFD	6.9.2011	SELL	8584,00	8855,00	-3,06042 %	-3,10823 %
39	JP225.CFD	22.9.2011	SELL	8391,00	8770,00	-4,32155 %	-4,41771 %
40	JP225.CFD	21.11.2011	SELL	8329,00	8371,00	-0,50173 %	-0,50300 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	STOXX50.CFD	14.1.2002	SELL	3499,40	3626,00	-3,49145 %	-3,55386 %
2	STOXX50.CFD	6.2.2002	SELL	3483,80	3523,00	-1,11269 %	-1,11892 %
3	STOXX50.CFD	20.2.2002	SELL	3423,30	3462,50	-1,13213 %	-1,13859 %
4	STOXX50.CFD	25.4.2002	SELL	3526,50	3452,60	2,14042 %	2,11783 %
5	STOXX50.CFD	29.5.2002	SELL	3366,50	3261,70	3,21305 %	3,16251 %
6	STOXX50.CFD	11.7.2002	SELL	2872,40	2627,40	9,32481 %	8,91532 %
7	STOXX50.CFD	19.8.2002	BUY	2822,50	2729,10	-3,30912 %	-3,36511 %
8	STOXX50.CFD	18.9.2002	SELL	2481,80	2438,70	1,76734 %	1,75190 %
9	STOXX50.CFD	7.1.2005	BUY	2810,80	2807,50	-0,11740 %	-0,11747 %
10	STOXX50.CFD	23.1.2005	BUY	2824,40	2914,30	3,18298 %	3,13337 %
11	STOXX50.CFD	16.3.2005	SELL	2872,20	2859,90	0,43008 %	0,42916 %
12	STOXX50.CFD	19.5.2005	BUY	2894,10	2973,20	2,73315 %	2,69646 %
13	STOXX50.CFD	4.7.2005	BUY	3073,60	3073,60	0,00000 %	0,00000 %
14	STOXX50.CFD	29.7.2005	BUY	3133,10	3135,80	0,08618 %	0,08614 %
15	STOXX50.CFD	10.8.2005	BUY	3168,40	3156,40	-0,37874 %	-0,37946 %
16	STOXX50.CFD	26.9.2005	BUY	3242,60	3276,70	1,05163 %	1,04613 %
17	STOXX50.CFD	25.11.2005	BUY	3309,30	3295,80	-0,40794 %	-0,40878 %
18	STOXX50.CFD	2.12.2005	BUY	3331,60	3324,60	-0,21011 %	-0,21033 %
19	STOXX50.CFD	3.1.2006	BUY	3375,40	3437,80	1,84867 %	1,83179 %
20	STOXX50.CFD	17.2.2006	BUY	3481,70	3489,30	0,21828 %	0,21805 %
21	STOXX50.CFD	13.3.2006	BUY	3524,40	3515,10	-0,26387 %	-0,26422 %
22	STOXX50.CFD	20.4.2006	BUY	3557,10	3558,70	0,04498 %	0,04497 %
23	STOXX50.CFD	3.6.2006	SELL	3272,60	3305,10	-0,98333 %	-0,98820 %
24	STOXX50.CFD	27.7.2006	BUY	3414,80	3417,90	0,09078 %	0,09074 %
25	STOXX50.CFD	15.8.2006	BUY	3470,50	3494,50	0,69154 %	0,68916 %
26	STOXX50.CFD	27.9.2006	BUY	3550,10	4017,30	13,16019 %	12,36343 %
27	STOXX50.CFD	14.12.2006	BUY	4120,10	4097,80	-0,54125 %	-0,54272 %
28	STOXX50.CFD	4.2.2010	SELL	2728,30	2735,50	-0,26321 %	-0,26355 %
29	STOXX50.CFD	3.3.2010	BUY	2804,00	2874,00	2,49643 %	2,46578 %
30	STOXX50.CFD	14.6.2010	BUY	2671,20	2729,80	2,19377 %	2,17005 %
31	STOXX50.CFD	13.9.2010	BUY	2798,30	2786,90	-0,40739 %	-0,40822 %
32	STOXX50.CFD	13.10.2010	BUY	2825,40	2825,40	0,00000 %	0,00000 %
33	STOXX50.CFD	4.11.2010	BUY	2896,80	2819,70	-2,66156 %	-2,69762 %
34	STOXX50.CFD	13.1.2011	BUY	2882,60	2911,10	0,98869 %	0,98384 %
35	STOXX50.CFD	27.4.2011	BUY	2992,50	2995,70	0,10693 %	0,10688 %
36	STOXX50.CFD	6.6.2011	SELL	2766,90	2782,60	-0,56422 %	-0,56582 %
37	STOXX50.CFD	12.7.2011	SELL	2692,20	2703,80	-0,42903 %	-0,42995 %
38	STOXX50.CFD	1.8.2011	SELL	2605,50	2047,30	27,26518 %	24,11027 %
39	STOXX50.CFD	6.10.2011	BUY	2233,60	2268,90	1,58041 %	1,56805 %
40	STOXX50.CFD	27.10.2011	BUY	2398,20	2364,80	-1,39271 %	-1,40250 %

Appendix 2 The return tables of the stock derivatives

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	CSCO.OQ.CFD	22.1.2002	SELL	18,05 €	19,49 €	-7,38840 %	-7,67558 %
2	CSCO.OQ.CFD	4.2.2002	SELL	18,02 €	17,29 €	4,22209 %	4,13540 %
3	CSCO.OQ.CFD	21.2.2002	SELL	16,25 €	16,01 €	1,49906 %	1,48794 %
4	CSCO.OQ.CFD	9.4.2002	SELL	15,96 €	14,99 €	6,47098 %	6,27023 %
5	CSCO.OQ.CFD	24.7.2002	SELL	12,29 €	13,11 €	-6,25477 %	-6,45894 %
6	CSCO.OQ.CFD	2.8.2002	SELL	11,50 €	11,72 €	-1,87713 %	-1,89497 %
7	CSCO.OQ.CFD	27.9.2002	SELL	11,13 €	9,25 €	20,32432 %	18,50206 %
8	CSCO.OQ.CFD	4.1.2005	SELL	18,99 €	18,93 €	0,31696 %	0,31646 %
9	CSCO.OQ.CFD	19.1.2005	SELL	18,44 €	18,45	-0,05420 %	-0,05422 %
10	CSCO.OQ.CFD	11.2.2005	SELL	17,40 €	17,89	-2,73896 %	-2,77717 %
11	CSCO.OQ.CFD	17.2.2005	SELL	17,37 €	17,64	-1,53061 %	-1,54245 %
12	CSCO.OQ.CFD	15.4.2005	SELL	17,51 €	17,69	-1,01752 %	-1,02274 %
13	CSCO.OQ.CFD	23.6.2005	BUY	20,00 €	19,78	-1,10000 %	-1,10609 %
14	CSCO.OQ.CFD	10.8.2005	SELL	18,81 €	17,87	5,26021 %	5,12653 %
15	CSCO.OQ.CFD	11.10.2005	SELL	17,32 €	17,21	0,63916 %	0,63713 %
16	CSCO.OQ.CFD	7.12.2005	BUY	18,00 €	17,72	-1,55556 %	-1,56778 %
17	CSCO.OQ.CFD	5.1.2006	BUY	18,00 €	18,93	5,16667 %	5,03762 %
18	CSCO.OQ.CFD	3.2.2006	SELL	18,14 €	18,11	0,16565 %	0,16552 %
19	CSCO.OQ.CFD	8.2.2006	BUY	19,43 €	21,24	9,31549 %	8,90679 %
20	CSCO.OQ.CFD	21.4.2006	SELL	20,75 €	20,73	0,09648 %	0,09643 %
21	CSCO.OQ.CFD	30.5.2006	SELL	19,98 €	20,04	-0,29940 %	-0,29985 %
22	CSCO.OQ.CFD	27.6.2006	SELL	19,31 €	19,95	-3,20802 %	-3,26060 %
23	CSCO.OQ.CFD	12.9.2006	BUY	22,35 €	22,55	0,89485 %	0,89087 %
24	CSCO.OQ.CFD	6.11.2006	BUY	24,79 €	26,66	7,54336 %	7,27240 %
25	CSCO.OQ.CFD	4.1.2010	BUY	24,21 €	24,56	1,44568 %	1,43533 %
26	CSCO.OQ.CFD	23.3.2010	BUY	26,44 €	25,99	-1,70197 %	-1,71662 %
27	CSCO.OQ.CFD	14.4.2010	BUY	26,83 €	26,94	0,40999 %	0,40915 %
28	CSCO.OQ.CFD	20.5.2010	SELL	23,23 €	23,49	-1,10685 %	-1,11303 %
29	CSCO.OQ.CFD	24.6.2010	SELL	22,51 €	22,61	-0,44228 %	-0,44326 %
30	CSCO.OQ.CFD	4.8.2010	BUY	23,97 €	23,60	-1,54360 %	-1,55563 %
31	CSCO.OQ.CFD	24.8.2010	SELL	20,95 €	20,37	2,84732 %	2,80754 %
32	CSCO.OQ.CFD	16.11.2010	SELL	19,83 €	19,42	2,11123 %	2,08925 %
33	CSCO.OQ.CFD	10.2.2011	SELL	19,00 €	18,74	1,38741 %	1,37787 %
34	CSCO.OQ.CFD	15.4.2011	SELL	16,97 €	16,93	0,23627 %	0,23599 %
35	CSCO.OQ.CFD	17.5.2011	SELL	16,52 €	16,44	0,48662 %	0,48544 %
36	CSCO.OQ.CFD	3.8.2011	SELL	14,79 €	14,62	1,16279 %	1,15608 %
37	CSCO.OQ.CFD	8.9.2011	BUY	16,46 €	16,32	-0,85055 %	-0,85418 %
38	CSCO.OQ.CFD	4.10.2011	SELL	14,97 €	15,47	-3,23206 %	-3,28545 %
39	CSCO.OQ.CFD	10.11.2011	BUY	18,60 €	18,43	-0,91398 %	-0,91818 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	E.ON.CFD	6.3.2002	BUY	16,31	15,91	-2,41629 %	-2,44596 %
2	E.ON.CFD	31.5.2002	SELL	18,53	18,88	-1,84322 %	-1,86042 %
3	E.ON.CFD	15.8.2002	BUY	17,32	17,13	-1,10867 %	-1,11486 %
4	E.ON.CFD	19.9.2002	SELL	15,76	15,08	4,49662 %	4,39845 %
5	E.ON.CFD	25.1.2005	BUY	22,72	23,31	2,56117 %	2,52892 %
6	E.ON.CFD	9.3.2005	SELL	22,26	22,11	0,66938 %	0,66715 %
7	E.ON.CFD	29.4.2005	SELL	21,33	22,11	-3,53686 %	-3,60092 %
8	E.ON.CFD	18.5.2005	BUY	22,44	22,44	0,00000 %	0,00000 %
9	E.ON.CFD	23.6.2005	BUY	24,24	24,08	-0,64364 %	-0,64572 %
10	E.ON.CFD	14.7.2005	BUY	25,02	24,27	-2,98561 %	-3,03109 %
11	E.ON.CFD	21.7.2005	BUY	25,05	25,46	1,64883 %	1,63539 %
12	E.ON.CFD	10.8.2005	BUY	25,72	25,92	0,80103 %	0,79784 %
13	E.ON.CFD	5.9.2005	BUY	26,52	26,37	-0,57307 %	-0,57471 %
14	E.ON.CFD	12.10.2005	SELL	24,82	24,72	0,40853 %	0,40769 %
15	E.ON.CFD	2.12.2005	BUY	27,32	26,92	-1,45686 %	-1,46758 %
16	E.ON.CFD	15.12.2005	BUY	27,57	29,09	5,50921 %	5,36281 %
17	E.ON.CFD	4.1.2006	BUY	29,78	29,61	-0,57757 %	-0,57924 %
18	E.ON.CFD	12.1.2006	BUY	29,96	29,75	-0,71090 %	-0,71344 %
19	E.ON.CFD	21.2.2006	BUY	31,74	30,06	-5,29384 %	-5,43911 %
20	E.ON.CFD	20.4.2006	BUY	31,67	32,01	1,07995 %	1,07416 %
21	E.ON.CFD	12.6.2006	SELL	27,77	27,79	-0,04678 %	-0,04680 %
22	E.ON.CFD	27.7.2006	BUY	30,39	32,06	5,48572 %	5,34054 %
23	E.ON.CFD	3.11.2006	SELL	30,30	30,80	-1,64280 %	-1,65645 %
24	E.ON.CFD	30.11.2006	BUY	32,78	31,63	-3,49962 %	-3,56232 %
25	E.ON.CFD	10.3.2010	BUY	27,09	26,40	-2,55776 %	-2,59104 %
26	E.ON.CFD	1.4.2010	BUY	27,52	27,47	-0,17081 %	-0,17096 %
27	E.ON.CFD	21.5.2010	SELL	24,41	23,91	2,06164 %	2,04068 %
28	E.ON.CFD	8.6.2010	SELL	23,41	24,15	-3,06004 %	-3,10784 %
29	E.ON.CFD	25.6.2010	SELL	23,01	22,13	3,97270 %	3,89582 %
30	E.ON.CFD	16.7.2010	SELL	21,84	22,96	-4,87762 %	-5,00060 %
31	E.ON.CFD	17.9.2010	SELL	21,81	21,30	2,38453 %	2,35654 %
32	E.ON.CFD	3.1.2011	BUY	23,16	22,98	-0,76000 %	-0,76290 %
33	E.ON.CFD	13.1.2011	BUY	23,35	24,92	6,73691 %	6,51968 %
34	E.ON.CFD	28.4.2011	BUY	22,69	23,17	2,13769 %	2,11517 %
35	E.ON.CFD	18.7.2011	SELL	18,24	18,85	-3,24155 %	-3,29525 %
36	E.ON.CFD	3.8.2011	SELL	18,20	14,11	28,95203 %	25,42703 %
37	E.ON.CFD	12.9.2011	SELL	13,19	13,11	0,57953 %	0,57786 %
38	E.ON.CFD	27.9.2011	BUY	16,00	15,91	-0,53750 %	-0,53895 %
39	E.ON.CFD	5.10.2011	BUY	16,85	17,20	2,06479 %	2,04376 %
40	E.ON.CFD	27.10.2011	BUY	18,12	17,10	-5,66131 %	-5,82788 %
41	E.ON.CFD	9.11.2011	SELL	16,16	17,05	-5,20387 %	-5,34416 %
42	E.ON.CFD	25.11.2011	SELL	16,07	16,59	-3,14590 %	-3,19645 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	WFC.N.CFD	7.1.2002	BUY	21,97	21,62	-1,59308 %	-1,60591 %
2	WFC.N.CFD	5.2.2002	SELL	22,55	23,22	-2,88544 %	-2,92789 %
3	WFC.N.CFD	26.2.2002	BUY	23,49	24,87	5,87484 %	5,70875 %
4	WFC.N.CFD	16.4.2002	BUY	25,37	25,12	-0,98542 %	-0,99030 %
5	WFC.N.CFD	2.5.2002	BUY	25,93	25,26	-2,58388 %	-2,61785 %
6	WFC.N.CFD	15.5.2002	BUY	26,21	26,32	0,41969 %	0,41881 %
7	WFC.N.CFD	26.6.2002	SELL	24,37	25,03	-2,63684 %	-2,67222 %
8	WFC.N.CFD	11.7.2002	SELL	24,38	23,86	2,17938 %	2,15597 %
9	WFC.N.CFD	8.8.2002	BUY	25,45	25,45	0,00000 %	0,00000 %
10	WFC.N.CFD	2.10.2002	SELL	23,02	22,66	1,58870 %	1,57621 %
11	WFC.N.CFD	3.1.2005	SELL	30,93	31,16	-0,73813 %	-0,74086 %
12	WFC.N.CFD	6.1.2005	SELL	30,92	30,72	0,65104 %	0,64893 %
13	WFC.N.CFD	10.2.2005	SELL	30,27	30,36	-0,29644 %	-0,29688 %
14	WFC.N.CFD	18.2.2005	SELL	30,12	29,97	0,50050 %	0,49925 %
15	WFC.N.CFD	22.3.2005	SELL	29,39	29,53	-0,47409 %	-0,47522 %
16	WFC.N.CFD	20.4.2005	SELL	29,12	29,58	-1,55510 %	-1,56732 %
17	WFC.N.CFD	18.5.2005	BUY	30,40	30,42	0,06579 %	0,06577 %
18	WFC.N.CFD	7.6.2005	BUY	30,89	30,55	-1,10068 %	-1,10678 %
19	WFC.N.CFD	3.8.2005	SELL	30,55	29,80	2,51678 %	2,48563 %
20	WFC.N.CFD	22.9.2005	SELL	29,10	29,47	-1,25551 %	-1,26346 %
21	WFC.N.CFD	28.9.2005	SELL	29,10	29,44	-1,15489 %	-1,16161 %
22	WFC.N.CFD	9.11.2005	BUY	30,33	30,98	2,14309 %	2,12045 %
23	WFC.N.CFD	18.11.2005	BUY	31,23	31,43	0,64041 %	0,63837 %
24	WFC.N.CFD	20.1.2006	SELL	30,98	31,35	-1,18022 %	-1,18724 %
25	WFC.N.CFD	2.2.2006	SELL	30,66	30,91	-0,80880 %	-0,81209 %
26	WFC.N.CFD	14.3.2006	BUY	32,47	32,21	-0,80074 %	-0,80396 %
27	WFC.N.CFD	26.4.2006	BUY	32,74	33,23	1,49664 %	1,48555 %
28	WFC.N.CFD	2.6.2006	BUY	33,84	33,84	0,00000 %	0,00000 %
29	WFC.N.CFD	8.6.2006	BUY	34,61	34,35	-0,75123 %	-0,75406 %
30	WFC.N.CFD	28.7.2006	BUY	35,99	36,14	0,41956 %	0,41868 %
31	WFC.N.CFD	18.10.2006	BUY	36,72	36,47	-0,68083 %	-0,68316 %
32	WFC.N.CFD	21.11.2006	SELL	35,72	35,15	1,62162 %	1,60861 %
33	WFC.N.CFD	10.3.2010	BUY	27,10	26,24	-3,18081 %	-3,23250 %
34	WFC.N.CFD	1.4.2010	BUY	27,52	27,45	-0,24713 %	-0,24743 %
35	WFC.N.CFD	21.5.2010	SELL	24,39	23,92	1,98194 %	1,96255 %
36	WFC.N.CFD	8.6.2010	SELL	23,41	24,16	-3,08386 %	-3,13242 %
37	WFC.N.CFD	25.6.2010	SELL	23,02	22,13	4,02242 %	3,94362 %
38	WFC.N.CFD	16.7.2010	SELL	21,85	22,97	-4,88941 %	-5,01299 %
39	WFC.N.CFD	17.9.2010	SELL	21,80	21,42	1,79288 %	1,77700 %
40	WFC.N.CFD	3.1.2011	BUY	23,16	23,00	-0,69085 %	-0,69324 %
41	WFC.N.CFD	13.1.2011	BUY	23,34	24,93	6,77690 %	6,55714 %
42	WFC.N.CFD	24.2.2011	SELL	24,10	23,39	3,03937 %	2,99410 %
43	WFC.N.CFD	28.4.2011	BUY	22,69	23,17	2,10628 %	2,08441 %
44	WFC.N.CFD	3.8.2011	SELL	18,20	13,88	31,15676 %	27,12230 %
45	WFC.N.CFD	27.9.2011	BUY	16,01	16,17	0,99925 %	0,99429 %
46	WFC.N.CFD	27.10.2011	BUY	18,12	17,11	-5,62238 %	-5,78662 %
47	WFC.N.CFD	25.11.2011	SELL	16,06	16,91	-5,01508 %	-5,14521 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	LLOY.L.CFI	24.1.2002	BUY	375,52	370,11	-1,44066 %	-1,45114 %
2	LLOY.L.CFI	14.2.2002	BUY	381,81	376,56	-1,37400 %	-1,38353 %
3	LLOY.L.CFI	17.4.2002	BUY	373,26	387,46	3,80484 %	3,73425 %
4	LLOY.L.CFI	3.7.2002	SELL	302,60	300,03	0,85726 %	0,85361 %
5	LLOY.L.CFI	24.7.2002	SELL	257,96	291,24	-11,42735 %	-12,13470 %
6	LLOY.L.CFI	3.9.2002	SELL	265,61	259,16	2,49233 %	2,46178 %
7	LLOY.L.CFI	5.11.2002	BUY	295,82	282,81	-4,39822 %	-4,49788 %
8	LLOY.L.CFI	6.12.2002	SELL	245,19	231,47	5,92517 %	5,75628 %
9	LLOY.L.CFI	25.1.2005	BUY	239,12	239,32	0,08531 %	0,08528 %
10	LLOY.L.CFI	16.3.2005	SELL	238,98	236,54	1,03494 %	1,02962 %
11	LLOY.L.CFI	26.5.2005	SELL	222,66	232,39	-4,18397 %	-4,27402 %
12	LLOY.L.CFI	6.7.2005	BUY	239,46	233,88	-2,32858 %	-2,35612 %
13	LLOY.L.CFI	11.7.2005	BUY	239,32	242,79	1,44867 %	1,43828 %
14	LLOY.L.CFI	6.10.2005	SELL	227,88	221,41	2,92172 %	2,87985 %
15	LLOY.L.CFI	17.11.2005	BUY	235,10	236,43	0,56401 %	0,56243 %
16	LLOY.L.CFI	6.12.2005	BUY	240,59	251,66	4,60079 %	4,49809 %
17	LLOY.L.CFI	19.1.2006	BUY	257,39	267,83	4,05808 %	3,97790 %
18	LLOY.L.CFI	12.5.2006	SELL	257,01	254,41	1,02396 %	1,01875 %
19	LLOY.L.CFI	16.6.2006	BUY	265,53	259,62	-2,22688 %	-2,25205 %
20	LLOY.L.CFI	30.6.2006	BUY	265,33	264,83	-0,18882 %	-0,18900 %
21	LLOY.L.CFI	3.8.2006	SELL	253,70	253,90	-0,07916 %	-0,07920 %
22	LLOY.L.CFI	21.9.2006	BUY	265,62	278,38	4,80463 %	4,69277 %
23	LLOY.L.CFI	27.11.2006	SELL	273,87	271,58	0,84395 %	0,84041 %
24	LLOY.L.CFI	5.2.2010	SELL	49,93	48,64	2,64381 %	2,60946 %
25	LLOY.L.CFI	12.2.2010	SELL	45,90	50,72	-9,49902 %	-9,98096 %
26	LLOY.L.CFI	10.3.2010	BUY	55,54	55,49	-0,09183 %	-0,09187 %
27	LLOY.L.CFI	7.4.2010	BUY	65,33	64,41	-1,39758 %	-1,40744 %
28	LLOY.L.CFI	25.5.2010	SELL	51,28	53,51	-4,16931 %	-4,25872 %
29	LLOY.L.CFI	17.6.2010	BUY	58,38	55,24	-5,38550 %	-5,53594 %
30	LLOY.L.CFI	9.7.2010	BUY	61,83	62,08	0,41082 %	0,40998 %
31	LLOY.L.CFI	26.7.2010	BUY	64,41	69,63	8,09607 %	7,78501 %
32	LLOY.L.CFI	4.8.2010	BUY	73,27	74,74	2,00216 %	1,98238 %
33	LLOY.L.CFI	13.9.2010	BUY	77,52	77,06	-0,58824 %	-0,58997 %
34	LLOY.L.CFI	21.9.2010	BUY	78,58	75,09	-4,44122 %	-4,54286 %
35	LLOY.L.CFI	14.1.2011	BUY	69,68	67,83	-2,66077 %	-2,69681 %
36	LLOY.L.CFI	19.4.2011	SELL	58,15	60,41	-3,73301 %	-3,80447 %
37	LLOY.L.CFI	4.5.2011	SELL	58,15	51,49	12,94721 %	12,17503 %
38	LLOY.L.CFI	12.7.2011	SELL	42,82	44,48	-3,73176 %	-3,80318 %
39	LLOY.L.CFI	18.7.2011	SELL	42,82	44,95	-4,73192 %	-4,84754 %
40	LLOY.L.CFI	2.8.2011	SELL	41,01	40,49	1,28186 %	1,27371 %
41	LLOY.L.CFI	16.9.2011	BUY	36,75	35,72	-2,79751 %	-2,83738 %
42	LLOY.L.CFI	27.10.2011	BUY	36,99	35,60	-3,76058 %	-3,83311 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	AEGN.AS.CFD	8.1.2002	SELL	28,0436	28,227	-0,64973 %	-0,65185 %
2	AEGN.AS.CFD	1.2.2002	SELL	26,5769	25,6904	3,45071 %	3,39250 %
3	AEGN.AS.CFD	20.2.2002	SELL	24,3546	24,8523	-2,00263 %	-2,02296 %
4	AEGN.AS.CFD	18.3.2002	BUY	27,8119	27,41	-1,44506 %	-1,45561 %
5	AEGN.AS.CFD	17.4.2002	BUY	28,4928	27,4975	-3,49316 %	-3,55563 %
6	AEGN.AS.CFD	21.5.2002	SELL	24,276	24,7213	-1,80128 %	-1,81770 %
7	AEGN.AS.CFD	11.7.2002	SELL	18,9592	19,4568	-2,55746 %	-2,59073 %
8	AEGN.AS.CFD	19.8.2002	BUY	14,6013	15,2443	4,40372 %	4,30951 %
9	AEGN.AS.CFD	31.10.2002	BUY	13,8626	13,0227	-6,05875 %	-6,25006 %
10	AEGN.AS.CFD	25.11.2002	BUY	14,9734	14,6212	-2,35217 %	-2,38028 %
11	AEGN.AS.CFD	4.1.2005	BUY	10,3011	10,4193	1,14745 %	1,14092 %
12	AEGN.AS.CFD	24.2.2005	BUY	10,7484	10,8886	1,30438 %	1,29595 %
13	AEGN.AS.CFD	19.5.2005	BUY	10,0785	10,16	0,80865 %	0,80540 %
14	AEGN.AS.CFD	16.6.2005	BUY	10,7493	10,6306	-1,10426 %	-1,11040 %
15	AEGN.AS.CFD	6.7.2005	BUY	10,9402	10,8783	-0,56580 %	-0,56741 %
16	AEGN.AS.CFD	28.7.2005	BUY	11,8587	11,769	-0,75641 %	-0,75928 %
17	AEGN.AS.CFD	20.9.2005	BUY	11,8979	11,4998	-3,34597 %	-3,40323 %
18	AEGN.AS.CFD	27.9.2005	BUY	11,8979	12,4082	4,28899 %	4,19956 %
19	AEGN.AS.CFD	18.10.2005	BUY	12,5821	12,4419	-1,11428 %	-1,12054 %
20	AEGN.AS.CFD	1.11.2005	BUY	12,683	12,9185	1,85682 %	1,83979 %
21	AEGN.AS.CFD	1.12.2005	BUY	13,6531	13,9727	2,34086 %	2,31388 %
22	AEGN.AS.CFD	4.1.2006	SELL	13,6139	12,9017	5,52020 %	5,37322 %
23	AEGN.AS.CFD	10.2.2006	BUY	13,569	13,6643	0,70234 %	0,69988 %
24	AEGN.AS.CFD	15.3.2006	BUY	14,2419	15,2219	6,88110 %	6,65469 %
25	AEGN.AS.CFD	31.5.2006	SELL	12,5498	13,043	-3,78134 %	-3,85469 %
26	AEGN.AS.CFD	6.6.2006	SELL	12,5498	12,4468	0,82752 %	0,82412 %
27	AEGN.AS.CFD	29.6.2006	BUY	13,2492	13,1019	-1,11177 %	-1,11799 %
28	AEGN.AS.CFD	1.9.2006	BUY	14,0589	13,8777	-1,28886 %	-1,29724 %
29	AEGN.AS.CFD	13.9.2006	BUY	14,2473	14,1096	-0,96650 %	-0,97120 %
30	AEGN.AS.CFD	12.10.2006	BUY	14,8995	14,6966	-1,36179 %	-1,37115 %
31	AEGN.AS.CFD	5.2.2010	SELL	4,2613	4,3311	-1,61160 %	-1,62473 %
32	AEGN.AS.CFD	23.3.2010	BUY	4,9592	5,0657	2,14752 %	2,12479 %
33	AEGN.AS.CFD	5.5.2010	SELL	4,9914	4,8527	2,85820 %	2,81812 %
34	AEGN.AS.CFD	25.5.2010	SELL	4,4826	4,4086	1,67854 %	1,66461 %
35	AEGN.AS.CFD	20.7.2010	SELL	4,2698	4,4086	-3,14839 %	-3,19902 %
36	AEGN.AS.CFD	23.8.2010	SELL	4,256	4,2513	0,11055 %	0,11049 %
37	AEGN.AS.CFD	19.10.2010	BUY	4,6384	4,5536	-1,82822 %	-1,84514 %
38	AEGN.AS.CFD	4.11.2010	BUY	4,6701	4,5995	-1,51174 %	-1,52329 %
39	AEGN.AS.CFD	8.3.2011	BUY	5,6836	5,5121	-3,01745 %	-3,06392 %
40	AEGN.AS.CFD	13.5.2011	SELL	5,0051	4,9268	1,58927 %	1,57677 %
41	AEGN.AS.CFD	3.6.2011	SELL	4,6062	4,498	2,40551 %	2,37704 %
42	AEGN.AS.CFD	11.7.2011	SELL	4,2967	4,3079	-0,25999 %	-0,26033 %
43	AEGN.AS.CFD	1.8.2011	SELL	3,9276	3,084	27,35409 %	24,18011 %
44	AEGN.AS.CFD	6.9.2011	SELL	2,7713	2,8891	-4,07739 %	-4,16285 %
45	AEGN.AS.CFD	12.9.2011	SELL	2,7713	2,8076	-1,29292 %	-1,30135 %
46	AEGN.AS.CFD	27.10.2011	BUY	3,7139	3,4918	-5,98024 %	-6,16652 %

Appendix 3 The return tables of the foreign exchange derivatives

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	USD/JPY.CFD	8.1.2002	BUY	132,290	131,247	-0,78842 %	-0,79154 %
2	USD/JPY.CFD	22.1.2002	BUY	133,337	134,085	0,56098 %	0,55942 %
3	USD/JPY.CFD	31.1.2002	BUY	134,903	132,380	-1,87023 %	-1,88794 %
4	USD/JPY.CFD	14.2.2002	SELL	131,914	132,974	-0,79715 %	-0,80034 %
5	USD/JPY.CFD	5.3.2002	SELL	131,837	131,165	0,51233 %	0,51102 %
6	USD/JPY.CFD	18.4.2002	SELL	130,184	128,680	1,16879 %	1,16201 %
7	USD/JPY.CFD	17.5.2002	SELL	126,751	124,364	1,91937 %	1,90118 %
8	USD/JPY.CFD	21.6.2002	SELL	122,794	117,857	4,18897 %	4,10361 %
9	USD/JPY.CFD	11.9.2002	BUY	120,276	122,860	2,14839 %	2,12564 %
10	USD/JPY.CFD	7.10.2002	BUY	124,209	124,200	-0,00725 %	-0,00725 %
11	USD/JPY.CFD	2.12.2002	BUY	123,154	122,140	-0,82336 %	-0,82677 %
12	USD/JPY.CFD	12.1.2005	SELL	102,328	103,537	-1,16770 %	-1,17457 %
13	USD/JPY.CFD	28.3.2005	BUY	106,866	107,608	0,69433 %	0,69193 %
14	USD/JPY.CFD	1.6.2005	BUY	108,880	108,138	-0,68148 %	-0,68382 %
15	USD/JPY.CFD	13.6.2005	BUY	108,880	111,319	2,24008 %	2,21536 %
16	USD/JPY.CFD	19.7.2005	BUY	112,591	111,488	-0,97965 %	-0,98448 %
17	USD/JPY.CFD	11.8.2005	SELL	109,856	110,598	-0,67090 %	-0,67316 %
18	USD/JPY.CFD	30.8.2005	BUY	110,810	110,471	-0,30593 %	-0,30640 %
19	USD/JPY.CFD	11.10.2005	BUY	114,372	114,896	0,45815 %	0,45711 %
20	USD/JPY.CFD	14.11.2005	BUY	118,361	118,477	0,09801 %	0,09796 %
21	USD/JPY.CFD	28.12.2005	BUY	117,638	116,547	-0,92742 %	-0,93175 %
22	USD/JPY.CFD	6.1.2006	SELL	115,493	115,952	-0,39585 %	-0,39664 %
23	USD/JPY.CFD	25.1.2006	BUY	115,952	117,007	0,90986 %	0,90574 %
24	USD/JPY.CFD	24.2.2006	SELL	116,736	117,629	-0,75917 %	-0,76206 %
25	USD/JPY.CFD	24.4.2006	SELL	115,466	110,762	4,24694 %	4,15924 %
26	USD/JPY.CFD	1.6.2006	BUY	112,979	115,141	1,91363 %	1,89555 %
27	USD/JPY.CFD	7.7.2006	SELL	114,060	115,682	-1,40212 %	-1,41204 %
28	USD/JPY.CFD	17.7.2006	BUY	116,682	116,682	0,00000 %	0,00000 %
29	USD/JPY.CFD	22.8.2006	BUY	116,764	116,142	-0,53270 %	-0,53412 %
30	USD/JPY.CFD	11.9.2006	BUY	117,466	116,331	-0,96624 %	-0,97094 %
31	USD/JPY.CFD	2.10.2006	BUY	118,250	118,791	0,45751 %	0,45646 %
32	USD/JPY.CFD	27.10.2006	SELL	118,061	118,196	-0,11422 %	-0,11428 %
33	USD/JPY.CFD	22.11.2006	SELL	116,520	115,871	0,56011 %	0,55854 %
34	USD/JPY.CFD	4.2.2010	SELL	89,113	91,275	-2,36867 %	-2,39717 %
35	USD/JPY.CFD	24.3.2010	BUY	91,069	93,282	2,43003 %	2,40097 %
36	USD/JPY.CFD	3.5.2010	BUY	94,775	92,973	-1,90135 %	-1,91965 %
37	USD/JPY.CFD	29.6.2010	SELL	88,958	88,752	0,23211 %	0,23184 %
38	USD/JPY.CFD	16.7.2010	SELL	86,950	87,748	-0,90942 %	-0,91358 %
39	USD/JPY.CFD	30.7.2010	SELL	86,255	86,796	-0,62330 %	-0,62525 %
40	USD/JPY.CFD	6.10.2010	SELL	82,858	81,981	1,06976 %	1,06408 %
41	USD/JPY.CFD	15.12.2010	BUY	84,405	83,550	-1,01297 %	-1,01814 %
42	USD/JPY.CFD	14.3.2011	SELL	81,653	81,992	-0,41345 %	-0,41431 %
43	USD/JPY.CFD	12.7.2011	SELL	79,684	77,852	2,35318 %	2,32592 %
44	USD/JPY.CFD	10.8.2011	SELL	76,311	77,420	-1,43245 %	-1,44280 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	GBP/CHF.CI	13.2.2002	BUY	2,43282	2,40544	-1,12544 %	-1,13182 %
2	GBP/CHF.CI	1.5.2002	SELL	2,34837	2,33825	0,43280 %	0,43187 %
3	GBP/CHF.CI	21.6.2002	SELL	2,26602	2,28475	-0,81978 %	-0,82316 %
4	GBP/CHF.CI	29.7.2002	BUY	2,30793	2,31328	0,23181 %	0,23154 %
5	GBP/CHF.CI	11.9.2002	BUY	2,333	2,32737	-0,24132 %	-0,24161 %
6	GBP/CHF.CI	9.10.2002	SELL	2,31152	2,31398	-0,10631 %	-0,10637 %
7	GBP/CHF.CI	23.12.2002	SELL	2,26116	2,24814	0,57915 %	0,57747 %
8	GBP/CHF.CI	2.2.2005	BUY	2,24907	2,25563	0,29168 %	0,29125 %
9	GBP/CHF.CI	29.3.2005	BUY	2,25705	2,25249	-0,20203 %	-0,20224 %
10	GBP/CHF.CI	13.4.2005	BUY	2,27558	2,27188	-0,16260 %	-0,16273 %
11	GBP/CHF.CI	16.5.2005	SELL	2,24879	2,24736	0,06363 %	0,06361 %
12	GBP/CHF.CI	7.6.2005	BUY	2,28812	2,3018	0,59787 %	0,59609 %
13	GBP/CHF.CI	12.9.2005	BUY	2,2924	2,29043	-0,08594 %	-0,08597 %
14	GBP/CHF.CI	14.11.2005	BUY	2,29214	2,26471	-1,19670 %	-1,20392 %
15	GBP/CHF.CI	13.12.2005	BUY	2,29414	2,27214	-0,95897 %	-0,96359 %
16	GBP/CHF.CI	30.1.2006	BUY	2,27471	2,26899	-0,25146 %	-0,25178 %
17	GBP/CHF.CI	23.2.2006	BUY	2,29272	2,28986	-0,12474 %	-0,12482 %
18	GBP/CHF.CI	5.4.2006	SELL	2,26071	2,26785	-0,31484 %	-0,31533 %
19	GBP/CHF.CI	30.6.2006	SELL	2,2567	2,26757	-0,47937 %	-0,48052 %
20	GBP/CHF.CI	2.8.2006	BUY	2,31185	2,33244	0,89063 %	0,88669 %
21	GBP/CHF.CI	14.9.2006	BUY	2,35036	2,34089	-0,40292 %	-0,40373 %
22	GBP/CHF.CI	18.10.2006	BUY	2,37739	2,35984	-0,73820 %	-0,74094 %
23	GBP/CHF.CI	13.12.2006	BUY	2,36959	2,37911	0,40176 %	0,40095 %
24	GBP/CHF.CI	6.1.2010	SELL	1,64312	1,66331	-1,21384 %	-1,22127 %
25	GBP/CHF.CI	23.2.2010	SELL	1,65882	1,60441	3,39128 %	3,33504 %
26	GBP/CHF.CI	22.4.2010	BUY	1,65083	1,64668	-0,25139 %	-0,25171 %
27	GBP/CHF.CI	1.6.2010	BUY	1,69139	1,66451	-1,58923 %	-1,60199 %
28	GBP/CHF.CI	2.8.2010	BUY	1,65621	1,64619	-0,60500 %	-0,60683 %
29	GBP/CHF.CI	25.8.2010	SELL	1,58288	1,58093	0,12335 %	0,12327 %
30	GBP/CHF.CI	18.11.2010	BUY	1,59654	1,57148	-1,56964 %	-1,58209 %
31	GBP/CHF.CI	13.12.2010	SELL	1,535138	1,48311	3,50803 %	3,44790 %
32	GBP/CHF.CI	7.2.2011	BUY	1,54211	1,53942	-0,17444 %	-0,17459 %
33	GBP/CHF.CI	11.3.2011	SELL	1,48835	1,48924	-0,05976 %	-0,05978 %
34	GBP/CHF.CI	3.4.2011	SELL	1,42851	1,45035	-1,50584 %	-1,51730 %
35	GBP/CHF.CI	27.5.2011	SELL	1,41089	1,38289	2,02475 %	2,00452 %
36	GBP/CHF.CI	11.7.2011	SELL	1,32624	1,3321	-0,43991 %	-0,44088 %
37	GBP/CHF.CI	28.7.2011	SELL	1,30345	1,2579	3,62111 %	3,55709 %
38	GBP/CHF.CI	26.8.2011	BUY	1,32153	1,30766	-1,04954 %	-1,05509 %
39	GBP/CHF.CI	21.9.2011	BUY	1,4129	1,4178	0,34680 %	0,34620 %
40	GBP/CHF.CI	7.11.2011	BUY	1,4497	1,43493	-1,01883 %	-1,02406 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	GBP/USD.CF	28.1.2002	SELL	1,403760	1,426670	-1,60584 %	-1,61887 %
2	GBP/USD.CF	1.4.2002	BUY	1,435830	1,454920	1,32954 %	1,32078 %
3	GBP/USD.CF	11.6.2002	BUY	1,470000	1,516920	3,19184 %	3,14196 %
4	GBP/USD.CF	8.7.2002	BUY	1,537440	1,570850	2,17309 %	2,14982 %
5	GBP/USD.CF	30.9.2002	BUY	1,572980	1,551630	-1,35730 %	-1,36659 %
6	GBP/USD.CF	7.11.2002	BUY	1,576400	1,572130	-0,27087 %	-0,27124 %
7	GBP/USD.CF	17.12.2002	BUY	1,596780	1,589930	-0,42899 %	-0,42991 %
8	GBP/USD.CF	8.2.2005	SELL	1,852420	1,858790	-0,34270 %	-0,34328 %
9	GBP/USD.CF	16.4.2005	SELL	1,858790	1,827760	1,69771 %	1,68346 %
10	GBP/USD.CF	13.6.2005	SELL	1,807880	1,813440	-0,30660 %	-0,30707 %
11	GBP/USD.CF	29.6.2005	SELL	1,800320	1,744240	3,21515 %	3,16455 %
12	GBP/USD.CF	20.7.2005	SELL	1,730710	1,755680	-1,42224 %	-1,43245 %
13	GBP/USD.CF	1.9.2005	BUY	1,817600	1,821760	0,22887 %	0,22861 %
14	GBP/USD.CF	7.11.2005	SELL	1,739440	1,739960	-0,02989 %	-0,02989 %
15	GBP/USD.CF	23.1.2006	BUY	1,781120	1,767580	-0,76020 %	-0,76310 %
16	GBP/USD.CF	19.4.2006	BUY	1,793630	1,779560	-0,78444 %	-0,78754 %
17	GBP/USD.CF	24.4.2006	BUY	1,793630	1,882190	4,93747 %	4,81945 %
18	GBP/USD.CF	4.8.2006	BUY	1,902510	1,881150	-1,12273 %	-1,12908 %
19	GBP/USD.CF	10.10.2006	SELL	1,860310	1,877500	-0,91558 %	-0,91980 %
20	GBP/USD.CF	10.11.2006	BUY	1,914490	1,894700	-1,03370 %	-1,03908 %
21	GBP/USD.CF	22.11.2006	BUY	1,914490	1,962430	2,50406 %	2,47322 %
22	GBP/USD.CF	4.2.2010	SELL	1,583190	1,578980	0,26663 %	0,26627 %
23	GBP/USD.CF	18.2.2010	SELL	1,553400	1,523930	1,93382 %	1,91536 %
24	GBP/USD.CF	7.10.2010	BUY	1,599340	1,574380	-1,56064 %	-1,57295 %
25	GBP/USD.CF	14.10.2010	BUY	1,599340	1,590310	-0,56461 %	-0,56621 %
26	GBP/USD.CF	3.11.2010	BUY	1,610490	1,599940	-0,65508 %	-0,65724 %
27	GBP/USD.CF	17.12.2010	SELL	1,548350	1,556610	-0,53064 %	-0,53205 %
28	GBP/USD.CF	1.2.2011	BUY	1,606310	1,610450	0,25773 %	0,25740 %
29	GBP/USD.CF	23.2.2011	BUY	1,627600	1,607280	-1,24846 %	-1,25632 %
30	GBP/USD.CF	22.3.2011	BUY	1,634290	1,629010	-0,32308 %	-0,32360 %
31	GBP/USD.CF	20.4.2011	BUY	1,642590	1,649100	0,39633 %	0,39554 %
32	GBP/USD.CF	22.6.2011	SELL	1,605420	1,608680	-0,20265 %	-0,20286 %
33	GBP/USD.CF	16.8.2011	BUY	1,647200	1,632300	-0,90457 %	-0,90868 %
34	GBP/USD.CF	6.10.2011	SELL	1,532540	1,558370	-1,65750 %	-1,67139 %
35	GBP/USD.CF	14.12.2011	SELL	1,542160	1,565710	-1,50411 %	-1,51554 %
36	GBP/USD.CF	29.12.2011	SELL	1,541910	1,547230	-0,34384 %	-0,34443 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	USD/DKK.C	7.3.2002	SELL	8,441130	8,501820	-0,71385 %	-0,71641 %
2	USD/DKK.C	14.3.2002	SELL	8,443660	8,466420	-0,26883 %	-0,26919 %
3	USD/DKK.C	17.4.2002	SELL	8,328040	8,137730	2,33861 %	2,31169 %
4	USD/DKK.C	17.5.2002	SELL	8,084630	8,102760	-0,22375 %	-0,22400 %
5	USD/DKK.C	15.7.2002	SELL	7,436050	7,397780	0,51732 %	0,51598 %
6	USD/DKK.C	3.9.2002	SELL	7,506540	7,581070	-0,98311 %	-0,98797 %
7	USD/DKK.C	1.11.2002	SELL	7,484390	7,399790	1,14328 %	1,13679 %
8	USD/DKK.C	12.12.2002	SELL	7,303110	7,175320	1,78097 %	1,76529 %
9	USD/DKK.C	18.1.2005	BUY	5,711140	5,688980	-0,38801 %	-0,38877 %
10	USD/DKK.C	4.2.2005	BUY	5,757670	5,777610	0,34632 %	0,34572 %
11	USD/DKK.C	8.3.2005	SELL	5,603680	5,572660	0,55665 %	0,55510 %
12	USD/DKK.C	14.4.2005	BUY	5,820820	5,769850	-0,87565 %	-0,87951 %
13	USD/DKK.C	12.5.2005	BUY	5,835220	6,075620	4,11981 %	4,03721 %
14	USD/DKK.C	23.6.2005	BUY	6,191500	6,120910	-1,14011 %	-1,14666 %
15	USD/DKK.C	29.6.2005	BUY	6,191500	6,228800	0,60244 %	0,60063 %
16	USD/DKK.C	3.8.2005	SELL	6,083610	6,040990	0,70551 %	0,70304 %
17	USD/DKK.C	1.9.2005	SELL	5,975730	5,982390	-0,11133 %	-0,11139 %
18	USD/DKK.C	19.10.2005	BUY	6,268760	6,198160	-1,12622 %	-1,13261 %
19	USD/DKK.C	4.11.2005	BUY	6,268760	6,307680	0,62086 %	0,61894 %
20	USD/DKK.C	4.1.2006	SELL	6,176240	6,171380	0,07875 %	0,07872 %
21	USD/DKK.C	16.3.2006	SELL	6,168130	6,211940	-0,70525 %	-0,70775 %
22	USD/DKK.C	4.4.2006	SELL	6,112960	6,171380	-0,94663 %	-0,95114 %
23	USD/DKK.C	18.4.2006	SELL	6,052920	5,806280	4,24781 %	4,16007 %
24	USD/DKK.C	18.7.2006	BUY	5,975030	5,939340	-0,59732 %	-0,59911 %
25	USD/DKK.C	22.11.2006	SELL	5,779200	5,645580	2,36681 %	2,33923 %
26	USD/DKK.C	20.1.2010	BUY	5,233090	5,401120	3,21091 %	3,16044 %
27	USD/DKK.C	24.3.2010	BUY	5,538850	5,501660	-0,67144 %	-0,67370 %
28	USD/DKK.C	12.4.2010	SELL	5,475490	5,485130	-0,17575 %	-0,17590 %
29	USD/DKK.C	22.4.2010	BUY	5,607710	5,728310	2,15061 %	2,12781 %
30	USD/DKK.C	1.6.2010	BUY	6,127290	6,198960	1,16969 %	1,16290 %
31	USD/DKK.C	1.7.2010	SELL	5,966760	5,902410	1,09023 %	1,08433 %
32	USD/DKK.C	22.9.2010	SELL	5,586910	5,492470	1,71944 %	1,70483 %
33	USD/DKK.C	6.1.2011	BUY	5,744310	5,675630	-1,19562 %	-1,20282 %
34	USD/DKK.C	2.2.2011	SELL	5,376880	5,366360	0,19604 %	0,19584 %
35	USD/DKK.C	11.7.2011	BUY	5,301130	5,227500	-1,38895 %	-1,39869 %
36	USD/DKK.C	29.8.2011	SELL	5,126510	5,151760	-0,49012 %	-0,49133 %
37	USD/DKK.C	22.9.2011	BUY	5,516200	5,471960	-0,80200 %	-0,80523 %
38	USD/DKK.C	30.9.2011	BUY	5,516200	5,543580	0,49636 %	0,49513 %
39	USD/DKK.C	12.12.2011	BUY	5,627850	5,680510	0,93570 %	0,93135 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	USD/HUF.CFD	2.1.2002	SELL	271,0400	275,1330	-1,48764 %	-1,49882 %
2	USD/HUF.CFD	26.2.2002	BUY	284,9840	278,5070	-2,27276 %	-2,29898 %
3	USD/HUF.CFD	1.4.2002	SELL	275,4930	269,1060	2,37341 %	2,34569 %
4	USD/HUF.CFD	21.5.2002	SELL	265,1070	260,8460	1,63353 %	1,62033 %
5	USD/HUF.CFD	15.7.2002	SELL	245,1220	245,1220	0,00000 %	0,00000 %
6	USD/HUF.CFD	10.12.2002	SELL	233,0910	226,9290	2,71539 %	2,67917 %
7	USD/HUF.CFD	20.1.2005	BUY	190,5690	189,0560	-0,79394 %	-0,79711 %
8	USD/HUF.CFD	7.2.2005	BUY	190,5370	188,0580	-1,30106 %	-1,30960 %
9	USD/HUF.CFD	14.4.2005	BUY	193,1590	189,6730	-1,80473 %	-1,82121 %
10	USD/HUF.CFD	27.4.2005	BUY	193,5260	193,3430	-0,09456 %	-0,09461 %
11	USD/HUF.CFD	12.5.2005	BUY	196,4620	198,0770	0,82204 %	0,81868 %
12	USD/HUF.CFD	17.6.2005	SELL	202,0660	204,5290	-1,20423 %	-1,21154 %
13	USD/HUF.CFD	21.7.2005	SELL	200,9330	196,3530	2,33253 %	2,30575 %
14	USD/HUF.CFD	1.9.2005	SELL	194,8760	198,8160	-1,98173 %	-2,00163 %
15	USD/HUF.CFD	13.10.2005	BUY	210,9310	207,8280	-1,47110 %	-1,48203 %
16	USD/HUF.CFD	9.11.2005	BUY	213,3720	212,9150	-0,21418 %	-0,21441 %
17	USD/HUF.CFD	3.1.2006	SELL	209,1090	208,0990	0,48535 %	0,48417 %
18	USD/HUF.CFD	29.3.2006	BUY	222,3890	217,8850	-2,02528 %	-2,04607 %
19	USD/HUF.CFD	18.4.2006	SELL	214,9340	213,3810	0,72781 %	0,72517 %
20	USD/HUF.CFD	25.7.2006	SELL	215,5180	210,8710	2,20372 %	2,17979 %
21	USD/HUF.CFD	19.10.2006	SELL	208,0840	206,5040	0,76512 %	0,76221 %
24	USD/HUF.CFD	7.1.2010	BUY	199,2180	196,2140	-1,50790 %	-1,51938 %
22	USD/HUF.CFD	27.1.2010	BUY	194,6800	192,1880	-1,28005 %	-1,28831 %
23	USD/HUF.CFD	19.2.2010	BUY	202,0940	198,0680	-1,99214 %	-2,01225 %
25	USD/HUF.CFD	27.4.2010	BUY	202,4770	211,7010	4,55558 %	4,45486 %
26	USD/HUF.CFD	17.5.2010	BUY	226,4050	228,3610	0,86394 %	0,86023 %
27	USD/HUF.CFD	8.7.2010	SELL	221,3260	219,4590	0,85073 %	0,84713 %
28	USD/HUF.CFD	29.7.2010	SELL	215,5510	214,2750	0,59550 %	0,59373 %
29	USD/HUF.CFD	3.11.2010	SELL	191,8750	194,9990	-1,60206 %	-1,61503 %
30	USD/HUF.CFD	3.3.2011	SELL	194,0600	196,0310	-1,00545 %	-1,01054 %
31	USD/HUF.CFD	18.3.2011	SELL	193,9250	185,2590	4,67778 %	4,57166 %
32	USD/HUF.CFD	12.7.2011	BUY	191,3370	189,9860	-0,70608 %	-0,70859 %
33	USD/HUF.CFD	9.8.2011	BUY	194,9380	188,6360	-3,23282 %	-3,28623 %
34	USD/HUF.CFD	5.9.2011	BUY	196,4020	193,4750	-1,49031 %	-1,50153 %
35	USD/HUF.CFD	30.9.2011	BUY	218,7990	215,0850	-1,69745 %	-1,71202 %
36	USD/HUF.CFD	27.10.2011	SELL	208,4440	219,2490	-4,92819 %	-5,05377 %
37	USD/HUF.CFD	9.11.2011	BUY	227,6900	224,6520	-1,33427 %	-1,34325 %
38	USD/HUF.CFD	24.11.2011	BUY	235,6980	235,1660	-0,22571 %	-0,22597 %
39	USD/HUF.CFD	28.12.2011	BUY	239,8240	240,0570	0,09715 %	0,09711 %

Appendix 4 The return tables of the commodities derivatives

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	GOLD.CFD	4.2.2002	BUY	289,10 €	292,80 €	1,27983 %	1,27171 %
2	GOLD.CFD	7.3.2002	SELL	289,70 €	293,80 €	-1,39551 %	-1,40534 %
3	GOLD.CFD	25.4.2002	BUY	306,70 €	306,60 €	-0,03261 %	-0,03261 %
4	GOLD.CFD	20.5.2002	BUY	313,60 €	316,00 €	0,76531 %	0,76239 %
5	GOLD.CFD	28.6.2002	SELL	315,60 €	315,70 €	-0,03168 %	-0,03168 %
6	GOLD.CFD	24.7.2002	SELL	310,00 €	312,00 €	-0,64103 %	-0,64309 %
7	GOLD.CFD	5.9.2002	BUY	317,80 €	317,50 €	-0,09440 %	-0,09444 %
8	GOLD.CFD	5.12.2002	BUY	324,90 €	343,20 €	5,63250 %	5,47959 %
9	GOLD.CFD	3.1.2005	SELL	431,10 €	427,00	0,96019 %	0,95561 %
10	GOLD.CFD	3.2.2005	SELL	416,20 €	418,00	-0,43062 %	-0,43155 %
11	GOLD.CFD	12.5.2005	SELL	421,70 €	419,50	0,52443 %	0,52306 %
12	GOLD.CFD	11.8.2005	BUY	443,70 €	435,90	-1,75794 %	-1,77358 %
13	GOLD.CFD	8.9.2005	BUY	449,30 €	463,70	3,20499 %	3,15470 %
14	GOLD.CFD	7.10.2005	BUY	475,100	469,300	-1,22080 %	-1,22831 %
15	GOLD.CFD	1.11.2005	SELL	459,700	465,400	-1,22475 %	-1,23231 %
16	GOLD.CFD	17.11.2005	BUY	480,200	489,500	1,93669 %	1,91818 %
17	GOLD.CFD	9.1.2006	BUY	540,910	555,200	2,64184 %	2,60755 %
18	GOLD.CFD	10.3.2006	SELL	534,600	555,000	-3,67568 %	-3,74493 %
19	GOLD.CFD	29.3.2006	BUY	570,400	586,900	2,89271 %	2,85166 %
20	GOLD.CFD	11.9.2006	SELL	606,100	598,900	1,20220 %	1,19503 %
21	GOLD.CFD	4.10.2006	SELL	571,000	589,300	-3,10538 %	-3,15462 %
22	GOLD.CFD	30.10.2006	BUY	601,800	597,900	-0,64806 %	-0,65016 %
23	GOLD.CFD	24.11.2006	BUY	636,400	636,400	0,00000 %	0,00000 %
24	GOLD.CFD	28.1.2010	SELL	1074,000	1102,200	-2,55852 %	-2,59182 %
25	GOLD.CFD	4.2.2010	SELL	1074,000	1125,800	-4,60117 %	-4,71039 %
26	GOLD.CFD	7.4.2010	BUY	1145,000	1143,900	-0,09607 %	-0,09612 %
27	GOLD.CFD	27.4.2010	BUY	1169,800	1176,000	0,53001 %	0,52861 %
28	GOLD.CFD	8.6.2010	BUY	1248,600	1241,300	-0,58465 %	-0,58637 %
29	GOLD.CFD	4.11.2010	BUY	1386,600	1386,100	-0,03606 %	-0,03607 %
30	GOLD.CFD	6.12.2010	BUY	1423,800	1408,400	-1,08161 %	-1,08750 %
31	GOLD.CFD	24.3.2011	BUY	1 445,20 €	1 425,30 €	-1,37697 %	-1,38654 %
32	GOLD.CFD	5.4.2011	BUY	1 445,20 €	1 451,30 €	0,42209 %	0,42120 %
33	GOLD.CFD	13.7.2011	BUY	1 576,60 €	1 590,40 €	0,87530 %	0,87149 %
34	GOLD.CFD	18.8.2011	BUY	1 815,20 €	1 855,80 €	2,23667 %	2,21202 %
35	GOLD.CFD	23.9.2011	SELL	1 700,70 €	1 644,80 €	3,39859 %	3,34211 %
36	GOLD.CFD	25.10.2011	BUY	1 695,90 €	1 700,00 €	0,24176 %	0,24147 %
37	GOLD.CFD	12.12.2011	SELL	1 665,40 €	1 604,40 €	3,80204 %	3,73155 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	SILVER.CFD	4.3.2002	BUY	461,20 €	464,00 €	0,60711 %	0,60528 %
2	SILVER.CFD	10.5.2002	BUY	467,10 €	495,00 €	5,97303 %	5,80144 %
3	SILVER.CFD	15.7.2002	BUY	513,10 €	497,20 €	-3,09881 %	-3,14784 %
4	SILVER.CFD	8.10.2002	SELL	437,00 €	438,20 €	-0,27385 %	-0,27422 %
5	SILVER.CFD	5.12.2002	BUY	463,10 €	459,10 €	-0,86374 %	-0,86750 %
6	SILVER.CFD	3.1.2005	SELL	655,90 €	648,00 €	1,21914 %	1,21176 %
7	SILVER.CFD	10.2.2005	BUY	686,10 €	735,00 €	7,12724 %	6,88471 %
8	SILVER.CFD	9.3.2005	BUY	754,00 €	735,00 €	-2,51989 %	-2,55219 %
9	SILVER.CFD	2.5.2005	SELL	680,40 €	697,10 €	-2,39564 %	-2,42480 %
10	SILVER.CFD	25.8.2005	SELL	680,90 €	685,30 €	-0,64205 %	-0,64412 %
11	SILVER.CFD	27.10.2005	BUY	788,10 €	757,00 €	-3,94620 %	-4,02617 %
12	SILVER.CFD	16.11.2005	BUY	788,10 €	806,10 €	2,28397 %	2,25828 %
13	SILVER.CFD	4.1.2006	BUY	923,00 €	881,10 €	-4,53954 %	-4,64581 %
14	SILVER.CFD	16.1.2006	BUY	923,00 €	909,20 €	-1,49512 %	-1,50641 %
15	SILVER.CFD	25.1.2006	BUY	923,00 €	952,10 €	3,15276 %	3,10408 %
16	SILVER.CFD	2.2.2006	BUY	992,80 €	1 018,80 €	2,61886 %	2,58515 %
17	SILVER.CFD	11.5.2006	BUY	1 467,10 €	1 429,80 €	-2,54243 %	-2,57531 %
18	SILVER.CFD	1.6.2006	SELL	1 190,00 €	1 124,70 €	5,80599 %	5,64370 %
19	SILVER.CFD	2.8.2006	BUY	1 179,50 €	1 196,90 €	1,47520 %	1,46443 %
20	SILVER.CFD	23.8.2006	BUY	1 263,30 €	1 198,10 €	-5,16109 %	-5,29904 %
21	SILVER.CFD	31.8.2006	BUY	1 263,30 €	1 263,30 €	0,00000 %	0,00000 %
24	SILVER.CFD	24.11.2006	BUY	1 321,50 €	1 392,10 €	5,34241 %	5,20459 %
22	SILVER.CFD	26.1.2010	SELL	1 673,90 €	1 546,80 €	8,21696 %	7,89680 %
23	SILVER.CFD	31.3.2010	BUY	1 764,20 €	1 814,10 €	2,82848 %	2,78921 %
25	SILVER.CFD	30.4.2010	BUY	1 859,00 €	1 805,80 €	-2,86175 %	-2,90350 %
26	SILVER.CFD	4.6.2010	SELL	1 739,30 €	1 797,50 €	-3,23783 %	-3,29141 %
27	SILVER.CFD	19.7.2010	SELL	1 753,50 €	1 811,80 €	-3,21779 %	-3,27070 %
28	SILVER.CFD	28.7.2010	SELL	1 753,50 €	1 801,10 €	-2,64283 %	-2,67838 %
29	SILVER.CFD	1.11.2010	BUY	2 490,70 €	2 651,20 €	6,44397 %	6,24486 %
30	SILVER.CFD	3.12.2010	BUY	2 932,50 €	2 939,70 €	0,24552 %	0,24522 %
31	SILVER.CFD	29.12.2010	BUY	3 068,40 €	3 013,60 €	-1,78595 %	-1,80209 %
32	SILVER.CFD	17.2.2011	BUY	3 122,20 €	3 256,80 €	4,31106 %	4,22072 %
33	SILVER.CFD	23.3.2011	BUY	3 674,70 €	4 569,10 €	24,33940 %	21,78448 %
34	SILVER.CFD	12.5.2011	SELL	3 301,70 €	3 591,80 €	-8,07673 %	-8,42160 %
35	SILVER.CFD	15.7.2011	BUY	3 885,80 €	3 919,90 €	0,87755 %	0,87373 %
36	SILVER.CFD	19.8.2011	BUY	4 223,80 €	4 247,90 €	0,57058 %	0,56895 %
37	SILVER.CFD	22.9.2011	SELL	3 875,00 €	3 294,80 €	17,60957 %	16,22002 %
38	SILVER.CFD	25.10.2011	BUY	3 305,10 €	3 290,90 €	-0,42964 %	-0,43056 %
38	SILVER.CFD	13.12.2011	SELL	3 063,50 €	2 915,00 €	5,09434 %	4,96882 %

#	Instrument	Date	Buy/Sell	Opening price	Closing price	Ret	LogRet
1	BRENT.CFD	4.1.2010	BUY	8051,00	7967,00	-1,04335 %	-1,04883 %
2	BRENT.CFD	30.3.2010	BUY	8204,00	8669,00	5,66797 %	5,51316 %
3	BRENT.CFD	3.5.2010	BUY	8790,00	8706,00	-0,95563 %	-0,96023 %
4	BRENT.CFD	17.5.2010	SELL	7745,00	7444,00	4,04352 %	3,96391 %
5	BRENT.CFD	2.8.2010	BUY	7983,00	8025,00	0,52612 %	0,52474 %
6	BRENT.CFD	1.10.2010	BUY	8283,00	8210,00	-0,88132 %	-0,88523 %
7	BRENT.CFD	3.11.2010	BUY	8600,00	8859,00	3,01163 %	2,96717 %
8	BRENT.CFD	2.12.2010	BUY	8959,00	9321,00	4,04063 %	3,96113 %
9	BRENT.CFD	27.1.2011	BUY	9880,00	10012,00	1,33603 %	1,32719 %
10	BRENT.CFD	14.2.2011	BUY	10330,00	10864,00	5,16941 %	5,04023 %
11	BRENT.CFD	1.4.2011	BUY	11845,00	12136,00	2,45673 %	2,42704 %
12	BRENT.CFD	8.6.2011	BUY	11840,00	11562,00	-2,34797 %	-2,37598 %
13	BRENT.CFD	24.6.2011	SELL	10516,00	11229,00	-6,34963 %	-6,56018 %
14	BRENT.CFD	8.8.2011	SELL	10220,00	10960,00	-6,75182 %	-6,99057 %

Appendix 5 The questionnaire (result 1)

HAAGA-HELIA
University of Applied Sciences

Questionnaire

1. **For how long have you been trading?**

- Investing since 90's, trading since 2008

2. **What do you think is interesting about the capital markets?**

3. **What types of tasks have you been working in?**

- IT Security, superior, CTO, data analysis

4. **Do you invest your own money? If not, you can skip the next question.**

   - Yes

5. **Do your personal investment strategies consider technical data as relevant?**
   - Yes

6. **Do your job related investment strategies consider technical data as relevant?**

- I'm only doing analysis for 3rd party companies, no investments. Analysis is all about gathering data and presenting data in an easy to understand *presentation*

7. Do you think one can continuously gain positive returns by applying pure technical analysis to investment decisions?

- it depends in which way it is done but generally speaking - yes

8. If your trading strategies apply technical analysis, could you shortly describe what tools and rules are used?

- Price action, momentum analysis, block trades, market breadth, volatility, volume, money flow, candlestick patterns etc. Rules depending on volatility and in which time frame trading is done.

9. Do you think a trader should pay attention to the:

Daily high/low prices	Yes
Opening and closing prices	Yes
High and low points of the trend	Yes
Volatility	Yes
Order flow	Yes
Fibonacci retracement levels	Yes
Moving averages	Yes
Trend lines	Yes

10. Which markets and what types of instruments do you trade?

- Depending on trading strategy but mostly ETF's (DAX, SPY, IWM). Occasionally stocks if interesting pattern is found.

11. How important do you think technical analysis is when it comes to trading?

- When it comes to (pure) trading, it is all about technical analysis. I don't even read the news but follow when important macro is released intraday.

12. What is your motto?

- Not dead, can't quit.

Appendix 6 The questionnaire (result 2)

Questionnaire

1. For how long have you been working in capital markets related job tasks and in which companies?

Since 1986

SYP,Servisen Arctos & Partners, Nordea, Lamy , UB

2. What do you think is interesting about the capital markets?

They keep evolving and changing constantly, and much of it is very much based on psychology & behaviourals

3. What types of tasks have you been working in?

Equity sales, proptrading & marker making in equities & equity derivatives, Buy side analyst, makro & strategies, portfolio management, bond trading...

4. Do you invest your own money? If not, you can skip the next question.

Yes

5. Do your personal investment strategies consider technical data as relevant?

Yes

6. Do your job related investment strategies consider technical data as relevant?

Yes

7. Do you think one can continuously gain positive returns by applying pure technical analysis to investment decisions?

No, at least not by using one constant "formula" over time. Different approaches work in different times and markets. The hard part is to detect when change comes, and find a new approach that will work.

8. If your trading strategies apply technical analysis, could you shortly describe what tools and rules are used?

Basic concepts of trend, support & resistance

To some extent momentum & volatility indicators

9. Do you think a trader should pay attention to the:

Daily high/low prices	**Yes**/ No
Opening and closing prices	Yes/ No
High and low points of the trend	Yes/ No
Volatility	**Yes**/ No
Order flow	**Yes**/ No
Fibonacci retracement levels	**Yes**/ No
Moving averages	**Yes**/ No
Trend lines	**Yes**/ No

10. Which markets and what types of instruments do you trade?

Currently mostly bonds, but also major equity indecies and Nordic stocks and FX

11. How important do you think technical analysis is when it comes to trading?

The shorter your timeframe, the more important it is
Day trading is mostly technical

Long term investments are least technical, but should be made taking trends etc. into consideration

12. What is your motto?

Keep it simple stupid

I mostly follow "plain vanilla" indicators and have seen too many collegues get lost into the endless fine tuning of short term oscillators etc., and loosing the big picture of the markets

Both respondents accepted that the answers could be published in this thesis.