

Master thesis

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Value and growth stocks on the Swedish stock market

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Executive Summary

This study investigates whether an investor can get superior returns when investing in value stocks (cheap stocks neglected by the market with a bad performance record) compared to investing in growth stocks (popular stocks with a good performance record) on the Stockholm stock exchange (1989-2010).

The classification of value and growth stocks is governed by financial ratios. In this study stocks with low price to earnings ratio, price to cash flow ratio, market to book value ratio and price earnings growth ratio are considered to be value stocks. Conversely, stock that score high on the aforementioned ratios are considered to be growth stocks. The stocks were sorted into different portfolios that consisted of only value stocks and only growth stocks. Holding periods for the portfolios looked at were 6, 12, 36 and 60 months.

The absolute returns and risk-adjusted returns for portfolios composed of value stocks and portfolios composed of growth stocks were compared. On average, the value portfolios had higher returns (also risk-adjusted returns) for all holding periods and all variables (except for the price earnings growth ratio where the opposite was true). This was also the case when comparisons were made over market boom and bust periods. Notably is that the betas were often lower for the value portfolios than for the growth portfolios.

This phenomenon of higher returns without higher risk is not necessarily contradicted by standard financial theories such as Efficient Market Hypothesis or the Capital Asset Pricing Model due to not all risk being reflected in beta. Furthermore, other explanations of why this so called value premium exists can be found in the field of behavioural finance where the irrationality of investors is taken into account (or the rationality of following the other irrational investors).

The conclusion is that an investor can get higher returns by investing in value stocks compared to growth stocks on the Stockholm stock exchange, even when the returns are risk-adjusted.

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1 Introduction

Buying underpriced stocks and selling them later at a higher price is an essential part of stock investments. What is interesting is that it seems that an investor could do a short and simple analysis to find these underpriced stocks by looking at economic data such as the relation between the price of the stock and its earnings. What is even more interesting is that according to the well rooted financial theories like Efficient Market Hypothesis and the Capital Asset Pricing Model, this approach should not work. These theories argue that such a simple analysis cannot give indications of superior returns. This study will look at this phenomenon, investigate whether it exists on the Swedish market and then try to explain why it can exist. This will partly be done through looking at theories from the field of behavioural finance¹.

Much literature and research have been produced in the field of stock investment in order to produce a strategy that outperforms the market and will provide an investor with superior returns. The purpose is to provide an investor with a model or framework in order to find underpriced and overpriced stocks. Once the appropriate stocks have been located, the investor can then buy the underpriced ones and short the overpriced ones in order to make a profit.

Most of these strategies use some kind of statistical algorithm and/or fundamental analysis², where the latter have been popular for many years. This report will focus on strategies that involve the fundamental analysis approach in order to find stocks that will outperform the market.

The study conducted in this paper will look at the two opposing strategies of investing in value stocks³ and investing in growth stocks⁴ on the Stockholm stock exchange. An investment in value stocks can be called a contrarian investment strategy. This is because value stocks consists of shares that have been overlooked by the market and therefore has a too low price. Finding these stocks and investing in them therefore goes against what the market in general is doing. Hence, this strategy is called contrarian since it is contrary to what the other investors in the market are

¹ Physiological and behavioural aspects affect the investment decisions of investors

² Doing analysis in order to find out the assets true value by looking at economic data

³ Stocks that have bad past performance and may be underpriced according to fundamental analysis

⁴ Stocks that have good past performance and may be overpriced according to fundamental analysis

investing in. Conversely, an investment in growth stocks is a conforming strategy since it is basically doing what the market in general is doing, i.e. investing in the popular stocks.

Many studies have been made on growth versus value stocks but only a few on the Swedish market and most research have focussed on the US market. One reason for this could be that the Swedish stock exchange is very small by international standards which make it harder to find sufficient data points and/or stocks to carry out the research compared to bigger exchanges with more stocks available. Furthermore, general stock market behaviour is perhaps not always that different between regions. Therefore an investor can assume that what works in the US works in the local market, thus making a local study redundant. However, I believe that there are regional differences and so a local study would be justified.

Previous studies on growth and value stocks made internationally have concluded that there is a value premium in the US market (Lakonishok, Shleifer, & Vishny, 1994, Fama & French, 1996, and Chan & Lakonishok, 2004). Other studies have found this premium to exist also outside the North-American market (Chan, Hamao, & Lakonishok, 1991 and Fama & French, 1998).

The few studies made so far on the Swedish market also confirm that there is a value premium. However, all of these studies lack one or more aspects to make the picture fully complete. The aim of this study is to build on the previous studies and add the elements that have been lacking⁵. For instance, a study made in 2008 (Wennicke) at Copenhagen Business School looked at the same stocks and roughly the same time period as this report did, but it did not accommodate a comprehensive comparison of risk-adjusted returns (betas were calculated for portfolios based on P/E but no comparison in risk-adjusted return was made) and did not sort the stocks into pure value and growth portfolios (the 30 stocks composing the OMXS30 index were simply divided into two groups of 15, one for value and one for growth; therefore many stocks in the sample could be argued to neither be value nor growth stocks). Moreover, a study made in 2006 (Carlström et al.) in Sweden did sort the stocks into pure value and growth portfolios but only looked at the two variables P/E and P/B. Also, the study did not account for different investment horizons; only a single one was used. Another Swedish study from 2008 (Carlsson et al.) had a

⁵ It is important to note that this study only borrows elements from the frameworks of the previous studies but all data analysis and models are done completely from scratch in this report

similar approach but an even shorter time period was used. Finally, Fama & French (1998) did an international study that also, to some extent, covered Sweden but since it is a bit old and did not focus on the Swedish stock market, a newer and more focussed study would be needed. All in all, the previous studies are very thorough and this paper follows their basic framework but tries to account for the shortcomings mentioned above. The aim is to make a paper that completes the picture of the Swedish value premium by building on the previous papers and improving the aforementioned aspects. By doing so the author of this report hopes to confirm, in a more comprehensive way than what have been done before, what the previous studies have concluded.

1.1 Objective

The main objective of this study is to investigate whether or not a value premium on the Stockholm stock exchange exists. This is done by categorizing stocks into value and growth stocks by using fundamental analysis, forming portfolios with either growth or value stocks and then comparing the return over time between the portfolios. This means that the method in this study is derived from the method used by Lakonishok et al. (1994) and the aim is to build on this study and other previous studies of the Swedish stock market, such as Wennicke (2008), Carlström et al. (2006) and Carlsson et al. (2008).

After analysis of these previous studies, some shortcomings were found; as discussed in the introduction. Therefore, the aim is to take the basic method from these studies and improve them by using a good risk-adjustment, flexible investment horizons, clear separation between value and growth stocks and by using a sufficiently long time period. Doing this, the author of this paper hopes to be able to make a more comprehensive and complete study of the existence of a value premium on the Stockholm stock exchange. Hopefully, previous findings made by other papers can be confirmed in this study.

1.2 Research question

Taking the above stated objective and the initial discussion into consideration, this report will focus on one main research question alongside a few sub-questions.

Main research question:

Can a contrarian investment strategy in value stocks yield a higher risk adjusted return compared to a conforming investment strategy in growth stocks on the Swedish stock market? A contrarian investment strategy is in this case a stock investment strategy that goes against the investment trends in the market. Conversely, a conforming strategy is a strategy that is conforming to the trends in the market. Moreover, value stocks are stocks with bad past performance and are deemed underpriced by economic analysis. Growth stocks are stocks with good past performance and are deemed overpriced by economic analysis.

The below sub-questions are also regarded as relevant to support the main question.

Firstly, in order to answer the main question, the current research made on this subject must be understood and presented:

• What do the standard financial theories say about contrarian investment strategies?

Secondly, finding possible causes and/or phenomena that can explain the presumed existing market abnormality:

• If an investor can make abnormal returns through contrarian investments, why is such an inefficient condition present?

Moreover, investigating which fundamental variables that can indicate possible yield above market return in order to understand the underlying mechanisms:

• Which of the fundamental variables Price/Earnings, Price/Cash-flow, Market-to-Book Value and Price-Earnings-Growth should be used as indicator for possible higher risk-adjusted return, if any?

This is important since the above variables and their ratios are used to separate stocks into growth (conforming strategy) and value (contrarian strategy) portfolios.

Finally, assuming the market does mean revert⁶, a test should be made in order to measure how long time it takes to revert back to equilibrium:

• Assuming contrarian investment strategies yield abnormal returns, which investment horizon is then preferable?

⁶ Mean reversion is when prices stray from their long term growth trend and then revert back to the trend again

These sub-questions together with the main research question should be enough to draw conclusions about whether a contrarian investment strategy could work on the Swedish market.

1.3 Methodology

In this section a discussion of the methodology used in this study will be presented in order to give the reader a quick overview of the limitations, premises, structure and theories used in this report. A more detailed discussion, where needed, will take place in the corresponding sections later in the paper.

1.4 Limitations & Premises

This report is subject to certain limitations and these will be addressed briefly below:

First, when looking at historic data it is tempting to extrapolate and/or assume that the market will behave in the same way as it did before. However, since the past cannot predict the future doing so is very risky. The statistical findings in this paper simply states what has been and the reader should be aware of the fact that markets may change characteristics and therefore a cautious approach should be used when trying to predict the future.

Second, the paper is limited to investigating stocks from the Stockholm OMXS30 Large Capitalization⁷ index (30 biggest companies on the Stockholm exchange) only in order to keep a high level of data quality. Therefore, mid capitalization and small capitalization companies are excluded from this study.

Third, the data used is from 1989 to 2010. This is due to the fact that only sufficient data could be obtained for this time-span.

Fourth, transaction costs and taxes are excluded but this should have no impact since the former and latter are affecting the returns equally for the portfolios compared.

⁷ Large, mid and small capitalization refers to the size of the stocks in terms of market value

Fifth, fixed holding periods are used and no rebalancing is done before the end of the specific investment horizon due to changes in taxes, market cap or other variables. Doing this would perhaps give a more realistic and efficient approach but would at the same time make comparisons between portfolios very difficult.

Sixth, mean reversion is considered present on the Swedish market. Frennberg and Hansson (1993) tested this on the Swedish market during the period 1919-1990 and they concluded that mean reversion was present. Wennicke (2008) tested mean reversion on the Swedish market 1987-2008 and she also found evidence of mean reversion even though the sample size was very small for such a test.

Seventh, data mining/back-testing⁸ is not considered present since the stocks and time-frame used are not chosen according to any specific event. They could be looked at almost randomly chosen due to the fact that the above was governed by what data was available and not picked in any way. However, data mining/back-testing is present when portfolio returns during boom-periods, bust-periods and economic cycles are looked at since this data was chosen due to specific events contained in the data. The main variable looked at for this study is still the average return over the period as a whole and the three instances where data mining is present are used as support but will not solely be relied upon.

1.5 Structure of the report

A structure of the report is given to the reader below so he or she can get an overview of how the paper is composed with respect to theory, data analysis and conclusions and how this can be followed throughout the study.

⁸ When the outcome of the analysis is affected by the time period chosen



Figure 1.1: Structure of the report

The first chapter presents the research questions at hand along with methodology.

The second chapter consists of a presentation of the theory available than may explain inconsistencies in returns between growth and value portfolios.

The third chapter elaborates on different investment paradigms and a more thorough presentation of the fundamental variables used in the paper. A presentation of and discussion about the Swedish stock market also takes place.

The fourth chapter is about the empirical analysis. Here the method is discussed along with comments to the data used.

The fifth chapter presents and discusses the results from the empirical analysis in text form and in graph/table form.

Chapter 6 then goes back and uses the theoretical framework with the empirical framework in order to draw conclusions. The main research question will be answered along with the sub-research questions in this section.

1.6 Literature basis/Theoretical foundation

In this study, the theoretical foundation mainly consists of articles, journals and books from the financial field. The literature used is considered by the author of this paper to have high quality and relevance. This is based on the fact that most of the literature used comes from highly respected and well-known authors within the financial field. Most articles have been published in acknowledged journals and have over time been subjected to review by other authors and the editors of the journals. Since there is a large amount of literature written on the subjects covered in this paper, there is always a risk that some relevant articles have been missed/looked-over. However, the author still believes that most of the important theoretical foundation is covered judging by what other papers on similar subjects in the USA, and elsewhere, have been using as their theoretical base.

2 Theoretical Framework

Looking at the available research, value stocks significantly outperform growth stocks on average (Capaul et al, 1993; Harris et al, 1994; Fama and French, 1998; Lee et al, 2009). Much debate has taken place about how this value premium can arise and the new theories challenge the traditional financial theories based on the arguments of efficient markets and risk and return. The standard financial theories seem quite limited and therefore one must turn to behavioural finance in order to find possible answers. The purpose of this section is to shed light on different theories that would explain or contradict the possibility of a value premium on the Swedish stock market.

This chapter will firstly cover the standard financial theories and will then move on to cover explanations found in the behavioural finance.

2.1 Efficient Market Hypothesis

The reason for including this section in the study is so the reader can get a basic understanding of one of the most widespread theories within the financial field which proposes that a value premium cannot exist. Efficient Market Hypothesis will also be discussed more in the section after this one.

The Efficient Market Hypothesis (EMH) is a highly reputed and much used theory within the financial field. Fama (1970) defined the efficient market as: "one in which stocks fully reflect all available information". In other words, the information available in the market which would indicate a future change in the price of an asset will influence the price already today. New data containing information about the future price of the asset should lead to an alteration of the price immediately. Therefore, all information is included in the price.

The EMH has three arguments or assumptions that it relies upon. These assumptions are not to be confused with the three forms of market efficiency; weak, semi-strong and strong. A market is efficient in the weak sense when all information contained by historical data will be reflected in the price. When a market is semi-strong the prices reflect all information stored in the historical

data and all publicly available information. A market is efficient in the strong sense when prices reflect all historical data, all publicly available and private information (Brealey et al, 2008). A schematic can be seen below in figure 2.1.



Figure 2.1: Different states of efficiency under EMH

As stated above, EMH has three arguments (that is not to be confused with the weak, semi-strong and strong states) as its foundation and each argument has gradually weaker assumptions. All of the arguments concern the rationality of investors.

Firstly, EMH says that most investors are rational and therefore price the assets in the market at the fundamental value.

Secondly, there are some irrational investors. But since the actions of these irrational investors will be random they will cancel each other out in the long run.

Thirdly, assuming some irrational investors exists and they are subject to herd mentality, this would lead to arbitrage opportunities since mispricing would occur. Other rational investors would then use the arbitrage opportunities and thus the prices would come to equilibrium again. So even if irrational behaviour is present, markets can still be efficient (Shleifer, 2000).

2.2 Theories explaining excess returns for value stocks under EMH

Looking at what drives the value premium, found in the work of Fama and French (2007), researchers have tried to come up with plausible explanations that explain why such a phenomenon can exist under EMH.

The average return for both value stocks and growth stocks can be separated into dividends and three sources of capital gains. These capital gains include growth in book value, increase in price due to mean reversion in profitability and expected returns and upward drift in MTBV, partly explained by inflation.

Fama and French (2007) also write that it's "a simple story that is driven by standard economic forces" that can explain the value premium. When researchers divide companies into growth portfolios and value portfolios these stocks tend to perform at the top and bottom part of the profitability spectre respectively. Therefore, the convergence in stock returns for value and growth stocks can be explained by the fact that competition will decrease the profitability of the high performing companies (growth) while the low performing companies (value) have a chance to improve performance after a turnaround of the company. DeBondt and Thaler (1985) constructed portfolios consisting of "winner" and "loser" stocks in order to show the above effect. Whether a stock qualified as a "winner" or "loser" depended on the past performance of the particular stock. According to their study, Loser stocks outperformed winner stocks by an average of 25%.

Judging by the above, one can suspect that this is an indication of the presence of mean reversion. Since the high performance stocks after a period of high growth reverts back downwards to the long term trend, or mean, while the low performing stocks also revert, but upwards to the mean. This concept of mean reversion is explained further in the following subchapter.

The reason for including this theory in the study is, as stated in the previous section, is to let the reader gain understanding of the theories that propose a value premium cannot exist and why it cannot exist.

2.3 CAPM and its limitations

This section is included to give the reader a brief overview of the Capital Asset Pricing Model (CAPM) and its shortcomings when it comes to predicting returns. This is important since CAPM proposes that a value premium cannot exist unless the value stocks have higher risk. This, however, is not the case empirically which will be discussed below.

According to the Capital Asset Pricing Model the premium associated with value stocks over growth stocks would be explained by the riskier characteristics of the former compared to the latter. The use of the CAPM is very widespread model that explains the return of an asset through the risk free rate of return, market return and unsystematic risk⁹.

Expected return = risk free rate + beta(market retrun - risk free retrun) Equation 2.1: CAPM

However, there are many empirical deviations from the CAPM. Some of the most noteworthy were highlighted by Fama and French in 1992. They conclude that beta seems to be a weak measurement of explaining returns (particularly in more recent periods) and CAPM is not good at explaining returns of stocks with certain characteristics (such as stocks with specific market capitalization). Also, the ten assumptions of the CAPM, which also deviates from reality, needs to be considered. Fama and French (1992) proved that market capitalization and the MTBV variable was better at explaining risk than the CAPM due to the strong interaction between these two factors and return. An alternative to the CAPM could therefore be a multi-factor model that uses the aforementioned factors, i.e. the Fama-French three-factor model (Brealey et al, 2008). Since beta is not the perfect risk measurement, Fama and French (1992) say that the abnormally high return of value stocks can exist due to the added risk not captured by beta (such as the risk of holding value stocks as opposed to holding growth stock).

The blind acceptance of the CAPM and its widespread use among investors can supposedly be a problem since the model fails to explain all risk associated with an investment. Therefore, using the CAPM will result in unpredicted risk and more uncertainty of the possible outcomes of a

⁹ Non-diversifiable risk associated with the individual asset

specific investment. As a consequence of this, much research has been made in the financial field due to CAPM's inability to explain inconsistencies in risk and return patterns. Researchers have been looking for new methods to more precisely analyze the relationship between risk and return. One of these inconsistencies is the premium associated with value stocks.

Harris and Marston (1994) showed that beta and the MTBV variable had a positive significant relationship due to the fact that higher risk is punished by higher expected return from investors. Therefore, beta could still be used as a variable when it comes to pricing an asset and that the higher return of value stock does actually indicate higher risk of some sort. This means that beta might me a variable that could be used to price assets and therefore the concept should not be disregarded. Moreover, Bernstein (2002) wrote that value stocks produced a higher return but they were also riskier than growth stocks. So, this is in line with the concept of the value premium being derived from higher risk.

The general expectation is that in period with positive stock returns (boom market) growth stocks will outperform value stocks. This is because investors tend to forecast future growth based on previous growth pattern and simply use extrapolation of the current trend. Also, this has been a common way of predicting returns during periods such as during the dot-com bubble around the year 2000 (Chan et al, 2004). The interesting thing is that when the bubble bursts, and stock prices starts to decline, growth stocks will have a more rapid decrease in prices than value stocks (Bernstein, 2002). This is also in line with Lee et al (2009) who say that new information concerning growth stock creates a much larger reaction than information concerning value stocks. With this in light, higher volatility in growth stock should be observed and this is also the case as proved empirically by Bernstein (2002). What complicates this picture is the fact that the value stock premium is still existent during boom periods as well as bust periods (Chan et al, 2004). This is inconsistent with CAPM and the model fails to explain this anomaly. If CAPM were to hold, and higher risk did explain the abnormal returns of value stocks, then a stock with higher beta would outperform in a boom period but would also underperform in a bust period. However, as stated by Chan et al, value stocks outperform growth stocks in general both during boom and bust periods.

Considering the above in this section, it is possible to conclude that the CAPM is not optimal when attempting to explain the persistent premium from value stock investment strategies.

2.4 Mean reversion

In this section the concept of mean reversion is presented and discussed. The reason for including this theory is because it can provide a possible explanation to the existence of a value premium in the stock market.

Mean reversion is a concept in statistics which argues over a certain time period the variable tends to move towards its long-term average. Exley et al (2004) say that the broadest definition of this phenomenon is:

"An asset model is mean reverting if asset prices tend to fall (rise) after hitting a maximum (minimum)."

To narrow the definition down a bit Exley et al also suggests a more precise statistical definition of the mean reversion:

"An asset model is mean reverting if returns are negatively auto correlated."

Lee (1991) describes this in a more practical way:

"Under this model, which has wide intuitive appeal, a below average return in one period is likely to be followed by compensatory above average returns in subsequent periods. It has frequently been said for example that the fantastic returns achieved in the 1980s were really a catching up exercise to make up for the poor returns in the 1970s"

Researchers have been debating whether mean reversion exists on the markets. Research conducted on the US stock market, using long time periods, showed mixed results. According to Balvers et al (2000), Campbell, Lo, and MacKinlay (1997) the research done can be concluded in the following statement:

"Overall, there is little evidence for mean reversion in long-horizon returns, though this may be more of a symptom of small sample sizes rather than conclusive evidence against mean reversion—we simply cannot tell."

However, proving that mean reversion is present in a data set can be challenging. Mean reversion is a phenomenon usually occurring slowly and over long time periods and so a challenge can be to find enough data to conduct a study since very long time series are needed (Balvers et al, 2000).

Frennberg and Hansson (1993) conducted a test on Swedish stock prices between 1919 and 1990. They concluded that there is indication of mean reversion and that the market does not follow a random walk. Furthermore, Risager (2008) concluded that there is indication of mean reversion on the Danish stock market. Also, Wennicke (2008) showed that there was indication of mean reversion on the Swedish stock market.

2.5 Market behavior – irrational investors

This section is included in order to give the reader an overview of the possible explanations of the existence of a value premium through looking at irrational behavior by the investors acting in the market.

Lakonishok et al (1994) and Haugen (1995) wrote that the value premium exists because the market prices value stocks lower and prices growth stocks higher due to irrational behavior. As argued by Lakonishok et al. (1994), the value premium associated with value stocks can actually be a result of growth stocks being overvalued. This overvaluation can be a result of past growth of the stocks which is then furthered by investors forecasting the same growth too far into the future. This is known in statistics as extrapolation and it relies upon the assumption that everything will continue as it always has done. Of course, in reality this is not always the case.

When the proper value of a stock is realized by the investors, the price of the growth stock reverts towards its fundamental, or true, value. This analysis also means that the same applies to value stocks. These stocks are undervalued because they are selected and sold due to investors extrapolating

the already weak trend and so they become undervalued. Since investors are aware of these processes of extrapolation in the market, through published academic articles on the topic, the value premium should be minimal since trading of the rational investors would bring the stocks back to their fundamental price (this will be discussed more below). Even so, the irrational behavior if the investors results in a significant value premium (Capaul et al, 1993).

Considering the above, Lakonishok et al (1994) argue that value stocks provide greater returns compared to growth stocks and this premium comes without extra risk which goes against the well established standard financial theory that says that return is dependent on risk; an investor can't get one without the other (Bernstein, 2002). This phenomenon can be explained by behavioral patterns by the investors and agency issues (Chan et al, 2004).

In light of the previous paragraph, one may come to the conclusion that it would be a bad strategy to invest in growth stocks and then why do investors keep doing this. As briefly mentioned above, agency issues can explain part of it. Many investors within certain fields or professions have very short-term incentives (sometimes due to career considerations). Depending on their job description or what their bosses or customers want, the investor does not have the luxury of waiting till a long-term investment pays off. The reason for this can be that they will have gotten fired or overtaken by colleagues or competition within the company where they work. Therefore, they stick to investing in growth stocks because these investments usually bring good short-term profits that please whomever they are responsible to. This type of investment pattern is particularly popular among institutional investors (Lakonishok et al, 1994 and Chan et al, 2004).

Moreover, increased trading commission from recommending successful growth stocks in some industries in the financial industry also furthers this irrational trading pattern of investing in growth stocks and disregarding value stocks. This is not in any way strange since a professional investor working for a financial institution will have it much easier selling or recommending a stock that can show a good track-record than a stock that has a bad track-record (Chan et al, 2004).

Taking the above into account, perhaps the professional investor's ability to beat the market portfolio using their skills and knowledge about the markets can be questioned. Also, this

includes the use of dynamic asset allocation¹⁰ when investing in growth stocks. One other part is the constraints in risk and cash flow needs that are governed by the framework which the investor must adhere to. If the investors were able to adopt a successful strategy of dynamic asset allocation, gains could be had from investing in growth stocks since the down side risk would be reduced. However, when looking at the real world there is not much evidence which suggests that investors apply dynamic asset allocation in a successful manner (Gruber and Goetzman, 2007). In other words, investment in growth stocks is an inferior investment strategy and therefore should not be adopted by any investor.

Considering the above it seems that MTBV (or any other variable separating growth stocks from value stocks) can be a good indicator when it comes to predicting future return. The actual growth in a particular stock will sooner or later turn in the opposite direction and leave the too optimistic investor with a negative return. In general, investor are too optimistic when it comes to future growth of stocks with a good track-record and too pessimistic about future growth of stocks with a bad track record.

All in all, the existence of a value premium in the market can, at least partly, be explained by irrational behavioral patterns of professional as well as amateur investors. Therefore, the MTBV variable used to distinguish growth stocks from value stocks could work quite well at indicating future returns (Chan et al, 2004).

2.6 Behavioral characteristics of investors

As in the previous section, this part of the study aims to give the reader an overview of the irrational investor behavior, and its causes, that possibly could explain the existence of a value premium in the market.

¹⁰A strategy used gain exposure to various investment opportunities while at the same time reduce down side risk, usually through a combination of stocks and zero-coupon bonds

2.6.1 The disposition effect

The disposition effect basically argues that investors tend hold on to badly performing stocks too long and at the same time sell off good performing stocks too soon (Odean, 1998a). Shefrin and Statman (1985) illustrate the effect produced by Odean in graph 2.1 below.



Graph 2.1: Illustration of the disposition effect (Odean, 1998a)

As illustrated above, the reader can see how the utility marginally decreases the higher or lower the gains or losses are. In other words, the investor should would gain more utility by selling off the stocks more early and reinvest the proceeds in another stock.

Why this disposition effect exists is not totally clear. There could be a number of reasons explaining the effect and Odean (1998a) provides a few suggestions:

• The investors will usually have a reference point of the price and from this point they want to their increase their gains. This point will change over time as a consequence of the price changes and previous performance of the underlying stock. On the one hand, if the expected gains arer not realized the investors will tend to hold on to the stock for too long hoping that the price will go above their reference point. On the other hand, if price

goes above the reference point the stock is typically sold off too soon even if there is more momentum left.

- At the year end the deadline for realizing tax benefits or losses occur. Therefore, an increase in realized losses can be observed in late December.
- Selling or buying at an inefficient time can be motivated by portfolio rebalancing.
- Investors may be reluctant to sell a stock with negative returns due to the increase of transaction costs

2.6.2 Overconfident investors and market dynamics

Odean (1998b) argues that the investment decisions taken by investors often deviate from equilibrium to some extent. In other words, investors are in most cases overconfident and sometimes under-confident when it comes to stock prices.

The state of confidence of the individual investors influences their investment decisions and it also influences the world financial markets. This effect creates inefficient fluctuations in the market as a whole. Reactions to new information on the market (which are causes of this effect) and consequently the inefficient fluctuations are caused by a combination of the investors individual utility function and how that investors values new information. A good understanding of underlying dynamics of investor confidence is vital for investment funds or other investors to minimize these inefficient fluctuations produced by the players in the market. This can lead to knowledge about how to get above market returns by utilising a superior investment strategy. Therefore, investigating the decisions of the individual investment managers or investors will be important (Odean, 1998b).

Hirshleifer et al. (1998) have in their study provided examples of evidence that suggests overconfident investor behaviour. This phenomenon is apparent in many industries and in many different types of decision processes, not only in the financial field. In general, the investors seem to overreact to private information and under-react to public information. Moreover, investors seem to be confident about their ability to make good decisions. At the same time they think that other investors are worse at this compared to themselves. This may sound irrational but all in all it means that the investor thinks he or she is smarter than any other investor. This phenomenon of

overconfidence makes the investors underestimate variability in the forecasts they make and rely heavily on their own forecasts compared to other forecasts available. Eventually, when the true price of the asset becomes apparent to the investor he or she takes credit for a good outcome and blame a bad outcome on others and external factors that the investor cannot influence. Considering this, there seem to be strong evidence towards irrational confidence concerning investors. The irrational behaviour of this nature causes even larger movements in the stock price and thus the price deviates even more from the fundamental price. After some time the public information available makes the prices revert back. So, for the short-term the momentum of the prices is the dominant factor but in the long-term prices go back to their fundamental value (Hirshleifer et al, 1998). This also supports the existence of mean reversion.

Griffin and Tversky (1992) showed in their study that professional institutional investors are even more self-confident than the private investors. This would imply that professional investors would get worse returns than their private counterparts.

Moreover Hirshleifer et al (1998) conclude that the prevalence of efficiency might not be as high in small cap stock as in large cap stock. This would be because small cap stocks have relatively higher costs when it comes to information gathering. Therefore, consequences of overconfidence can be more evident on small cap stocks. This is due to the fact that inefficiencies of pricing will exist longer because of weaker and lower frequency of public information associated with small cap stocks. Thus, relatively lower information gathering costs can lead to higher efficiency in the market. The observed higher risks for small cap stocks may be caused by this effect.

2.6.3 Investor overconfidence and the disposition effect together

Statman et al (2006) makes a distinction between investor overconfidence and the disposition effect. They say that overconfidence is a behavioural attribute affecting investors in general whereas the disposition effect is more of an attitude towards specific stocks. Therefore, a distinction was done since the two concepts cannot easily be incorporated into each other.

The disposition effect suggests that investors wants to realize positive returns if stock price goes up while investors tend to not realize a negative return if the stock price goes down. Investor overconfidence says that the momentum in stock price increases due to an initial increase. Furthermore, the disposition effect argues that investors sell their good performing stocks too soon which actually negate the increase in momentum relatively fast. Also, overconfidence is in line with the disposition effect when stock prices goes down since the investors tend to hold on to badly performing stocks too long since they expect the price to increase again. Therefore, the disposition effect can also suggest that if stock prices go down the efficiency will also go down since investors will be holding on to the stock.

Moreover, Statman et al (2006) argue that stock turnover increases after increased market returns. This result actually is an effect of combination of extrapolation and overconfidence among investors in the market as well as confirmation of the disposition effect. This result is additionally also more noticeable for small cap stocks (Statman et al, 2006). The cause of this can be a result of the lower liquidity and the higher volatility associated with low cap stocks of small stock compared to large cap stocks. Finally, the results confirm in the study further points to the existence of overconfidence and the existence of a value premium in the market.

2.7 The band wagon effect or lemming effect

The band wagon effect or lemming effect is initially a concept stemming from the supply and demand function within micro economics (Leibenstein, 1950). The theory argues that the more people that start to buy a certain product more people will follow and so increasing the demand for this product. The expression "hop on the band wagon" is used when this occurs. Actually, even if it seems irrational to hop on the band wagon it can still be rational to do so as long as the investors know when to get off.

The concept applied to the financial market could well explain the existence of a value premium. The reasoning would be that when investors start to buy a certain stock more and more will follow. This would continue until some investors would question the rationality of continuing investing in this popular stock and therefore they will start to sell before everybody else does. When this happens a trend in the opposite direction will start and thus the price of the popular stock will come down again. The theory would explain why the performance of value stocks and growth stocks go towards their fundamental prices. Value stocks would initially be low priced

since nobody is getting on their band wagon whereas the growth stocks would be highly priced since the investors are getting on that band wagon instead. After a while the rational investors start to get out and buy the value stocks instead. The rest of the investors follows ant so the prices of the value stocks rise while the prices of the growth stocks fall (Kaizoji, 2000).

2.8 Rebalancing and transaction costs

This section is included in order to give a basis for discussion of the optimal holding period or investment horizon.

The total cost of holding a portfolio of stocks is partly affected by the total cost of transactions which in turn is affected by the frequency of these transactions. This is important to keep in mind since the more often a portfolio is rebalanced the higher the transaction costs.

Actually, some researchers argue that adopting a buy and hold strategy is optimal. Barber and Odean (2000) suggest that rebalancing has a negative impact on portfolio performance for both private investors and professional investors. Many investors do seem to have a rather irrational trading frequency which results in poorer performance compared to buying and holding the market portfolio. This can be attributed to overconfidence among investors and a positive relation between transaction costs and the frequency of trades. Both of these factors have an noticeable impact on the performance of the portfolio. Having a high trading frequency does not seem to impact the performance in a negative way but the transaction costs in this case do. Looking at graph 2.2 below the reader can find an illustration of how portfolio performance deteriorates with trading frequency.



Graph 2.2: Relation between trading frequency and deterioration of performance (Barber, 2000)

It is important to note that investors would at some point in time have to rebalance in order to have a proper diversified portfolio (due to changes in market cap of the individual stocks over time).

2.9 Summary

Considering the theories put forward in this section there are suggestions of why a value premium can exist in the market.

Firstly, the markets may not be totally efficient since the argument put forward by EMH relies on very strong assumptions. Moreover, I would argue that markets cannot be efficient since it costs time and money to search for information. If all information is included in the price already, nobody would bother spending time and money looking for information. If nobody is searching for information, prices cannot include the information and thus markets are not efficient. Also, even if markets were efficient, a value premium could still arise due to the fact that growth stocks 24

performance would erode due to increased competition while the value stocks would have the ability to turn around their company in order to increase growth. This concept was further elaborated on in section 2.2 with the looser and winner argument. Taking all this into account, EMH does not prohibit the existence of a vale premium.

Secondly, the traditional CAPM fails to take the whole risk into account since it relies solely on beta as a proxy for the risk. This is further highlighted by the fact that value stocks does not have a greater risk than growth stocks and the former also tend to outperform the latter both in boom and bust periods. Therefore, CAPM does not necessarily contradict a value premium.

Thirdly, the statistical concept of mean reversion could explain the existence of the value premium since the low performing stocks would be expected to revert back to the long term trend by improving their performance. Consequently, growth stocks would have deteriorating performance in order to reach their long-term trend. This concept goes hand in hand with the value premium and the research suggests that mean reversion is present on the Swedish stock market.

Fourth, irrational investor behaviour such as extrapolation and different agency problems can be a plausible explanation for the existence of a value premium. The extrapolation gives a wrong indication of the stocks future performance and this is after a while corrected so the prices moves towards their fundamental values. Also, investors may be short-sighted and just want quick return and therefore they invest heavily in growth stocks. Moreover, the investors may choose growth stock in favour of value stocks in order to please a superior or a customer. This favour-ism of growth stock tends to increase their prices and reduce the prices of value stocks since they get neglected. Once again, after a while the price would revert back to its fundamental value just as in the case of extrapolation.

Fifth, the disposition effect coupled with overconfident investors may explain why a value premium is existent. This is because the investors wants to realize positive returns if stock price goes up while investors tend to not realize a negative return if the stock price goes down. Moreover, the concept of investor overconfidence says that the momentum in stock price increases due to an initial increase. Furthermore, the disposition effect argues that investors sell

their good performing stocks too soon which actually decrease the increase in momentum. In addition, overconfidence is in line with the disposition effect when stock prices goes down since the investors tend to hold on to badly performing stocks too long since they expect the price to increase again.

Sixth, the band wagon effect is also in line with a value premium since even the rational investors tend to follow the actions of the majority. Once the majority feel that a stock is over-priced or under-priced they will all start to reverse their trading pattern and start to buy value stocks and sell growth stocks and thus bringing the prices closer to their fundamental values.

All in all, the traditional financial theories do not contradict a value premium and most of the behavioural finance theories deal with the fact that not all, or any, investors are rational. This can potentially explain why such an inefficient phenomenon such as a value premium may be prevalent on the Swedish market.

Finally, the holding period and trading frequency will affect the total return of the investor's portfolio through the cost of transactions.

3 Investment strategies

There are a large number of investment philosophies one could use in order to try to beat the market. This section will discuss the strategies of investing in value stocks and investing in growth stocks in order to give the reader a good overview of the strategies used in the empirical research conducted in this study.

3.1 Contrarian investment strategies

An investor following a contrarian strategy is a person with a preference for taking a position that is opposite of the positions which is held by the majority in the market.

However, contrarian strategies do not always mean strictly 'do the opposite'. It is true that investors following a contrarian strategy buy or sell their assets when the other investors generally do the opposite, but this is always done in relation to the price of the asset. For instance, if the stock price is very high a contrarian investor would still sell the asset so following the rest of the players in the market. Keynes (1936) argued that the contrarian investor should be eccentric, unconventional and rash in the eyes of the average opinion.

Lakonishok et al (1994) discuss what they refer to as a conforming strategy or a native strategy. What they refer to is when investors rely too much on historical data or performance and news about the stock. The conforming investors then tend to extrapolate the performance too far into the future (this was already discussed in chapter 2). The alternative to the conforming strategy would then be the value strategy as argued by Lakonishok et al (1994). The value strategy is supposed to produce superior returns compared to the conforming strategy. One assumption that is needed to get this theory to work is that investors make large errors and rely heavily on extrapolation.

A classic example of the use of a contrarian strategy is the story from 1929 involving Joseph Kennedy (JFK's father). He got a stock advice from a shoe-shining boy and this led him to selling all his stock and so avoiding the market crash. He reasoned that if even the poorest were

buying stock there was nobody left to enter the market and therefore nobody would be left to drive the prices up. This proves a valid point and demonstrates how contrarian investors looks for points of maximum exuberance or despair and that is when the majority is wrong (Swensen, 2000).

A successful implementation of the contrarian strategies calls for a clear classification of the different asset classes the investor is investing in. Moreover, in order to do this the investor must be aware of underlying drivers that determine the classification. A popular way of classifying stocks is to sort them into value categories or growth categories.

In 1994 Lakonishok et al tested the US market in order to investigate whether they could find a dominant strategy¹¹. There was strong indication of superior returns when investments were done in value stocks compared to growth stocks. In table 3.1 below the reader can find a summary of their findings. There were 10 portfolios each containing stocks that were pure growth, pure value or a combination of both. The portfolio named 1 was a pure growth and then as the number went higher the more value stocks entered the portfolio until the pure value portfolio was reached (number 10). To the left in the table the reader finds the variables used to classify the stocks. It is clear that the more value stocks the portfolio contained the better the return.

	Growth stocks						Value stock			
Variable	1	2	3	4	5	6	7	8	9	10
Market to Book Value	0,093	0,125	0,146	0,154	0,158	0,166	0,184	0,189	0,196	0,198
Price to Cash Flow	0,091	0,122	0,145	0,157	0,166	0,171	0,18	0,192	0,199	0,201
Price to Earnings	0,114	0,126	0,143	0,152	0,160	0,167	0,188	0,191	0,196	0,190
Growth in Sales	0,127	0,155	0,164	0,165	0,171	0,171	0,183	0,187	0,195	0,195

Table 3.1: Annual returns from the investigation of the US stock market by Lakonishok et al(1994), investing in deciles of value and growth stocks.

¹¹ A strategy that is always preferable

3.2 Value versus growth

Table 3.2 below has been created for the reader's convenience, to make it easier to see the connections between the variables used and the value and growth strategies. Below follows a brief discussion about the variables.

Growth Stocks	Value Stocks
High P/E	Low P/E
High P/C	Low P/C
High MTBV	Low MTBV
High PEG	Low PEG

Table 3.2: The variables

P/E

The P/E ratio, or price in relation to the company's earnings, gives an indication of how low or high the price of the stock is in relation to the earnings. A low P/E ratio indicates that the price is very modest compared to its earnings capability. Conversely, a high P/E ratio indicates that the price is very high compared to its earnings capability. A low ratio then could mean that the stock is cheap (or underpriced) and a high ratio could mean that the stock is dear (or overpriced). Therefore, a stock with a low P/E ratio is considered to be in the value category.

P/C

The P/C ratio, or price in relation to the company's cash flow, gives an indication of how low or high the price of the stock is in relation to the cash flow available. Just as in the case of P/E, a low ratio indicates that the price is very low compared to the amount of cash flow that the company generates. Therefore, a stock with a low P/C ratio is considered to be in the value category.

MTBV

MTBV stand for Market To Book Value and give an indication of the price (market value) in relation to its book value (the total value available in the balance sheet). A high ratio indicates that the market price is much higher than the book value. Conversely, a low ratio means that the stock is trading close to (or even below) the book value of the company. This means that a company with a low ratio is considered to be a value stocks since there is a possibility that the company is underpriced.

PEG

The PEG ratio stands for Price Earnings Growth. This variable is similar to the P/E ratio but it also captures the momentum in the stock or how fast the P/E ratio is changing. A low PEG could indicate that the stock is neglected by the market and therefore it could be underpriced (value). The PEG was included instead of Growth in Sales, as used by Lakonishok et al (1994) in order to give a better indication of the stock momentum. Growth in P/E is considered by me to be a better performance indicator than growth in sales since earnings is a better predictor of company performance than sales. The PEG is a good indicator for finding bargain stocks (Lynch, 1989)

3.3 Value stocks

Swensen (2000) argues that the most important choice an investor has to face is whether to invest in value or growth stocks. Value investing in this sense is investing in a stock that is priced at its fundamental vale according to some variable. This could be a stock with a low P/E ratio or a low MTBV ratio. These stocks would fall under the value category and they would have poor past performance and the performance trend is believed to continue by the market at large.

When buying value stocks the investor buys stocks that are very unpopular or neglected by the market. Under normal market conditions this strategy can yield the investor very good returns, partly due to the fundamentals tendency to revert to its mean, as argued by Swensen (2000) and shoved by Balvers et al (2000).

3.4 Value investing

Value investing and contrarian strategy usually refers to the same thing. The term value investing stems from Colombia Business School where Benjamin Graham and David Dodd in 1934 first used the concept in their book Security Analysis. After that it was further elaborated on in Graham's book The Intelligent Investor which was published in 1949. In general, the investors which use this strategy searches for opportunities to buy stocks when they seem underpriced according fundamental analysis. Graham (1973) put this in the following context:

"The margin of safety idea becomes evident when we apply it to the field of undervalued or bargaining securities. We have here, by definition, a favourable difference between prices on the one hand and indicated or appraised value on the other. That difference is the margin of safety."

The investor calculates the fundamental value and compares this to the price of the asset in order to make decide whether to invest or not. The bigger the margin of safety is the more undervalued the stock is.

There are a lot of investors following the strategy first developed by Graham and one of them is Warren Buffet who in the 2003 edition preface of The Intelligent Investor described it as: "by far the best book on investing ever written".

Many researchers have concluded that this strategy yields superior returns. Risager (2008) made a test on the Danish market between 1950 and 2004. In that study he found a value premium of around 5% and just a small percentage of the premium could be explained by standard deviation. Similar tests around the world have been conducted in different markets most of them indicate similar results. This gives the strategy much credibility.

3.5 Growth stocks

Stocks associated with companies whose earnings are expected to grow at a rate higher than the market in general are often called growth stocks. Since companies that have high growth usually reinvest their dividends to fund future growth these stocks do not typically pay out any dividend.
However, it is important to note that a growth company does not automatically constitute a growth stock.

Swensen argues that an investor engaging in pure investment in growth stocks do not usually take fundamental analysis into account. The investor's strategy is instead composed of analysing the markets interpretation of the particular stock's future development. Furthermore an investor in growth stocks does not care what the fundamental value is as long as the market believes that the price today is lower than the price in the future (Swensen, 2000).

3.6 Momentum investing

While value strategies are based on some form of fundamental analysis, momentum strategies try to capitalize on the assumption that trends in the market will continue in the same direction as they are heading right now. Investing in growth stocks is a form of momentum investing.

Swensen say that many researchers have been trying to investigate how a momentum strategy can yield high returns compared to the market as a whole. A possible answer could be that seasonal effects could explain the return. Moreover, theories that support EMH could explain the returns through additional risk associated with growth stocks and the possibility of investors to capitalize on other investors' flaws, confirmation biases¹², overreactions and under-reactions. Another possibility could be that since prices do not always move particularly quickly up or down there is enough time for an investor to take advantage of the current trend before it turns in another direction. A problem with this strategy arises when "… *fools come to their senses*." and the price start to revert back to its fundamental value and the investor is not fast enough to sell of his or her investment (Swensen, 2000).

¹² People tend to prefer information that confirm their belief and at the same time disregard information that does not.

3.7 The Stockholm OMXS30 index

This section is included in order to give the reader an overview of the OMXS30 index and how it has developed over time. Also, a graph depicting the return for the 3 month Swedish T-bill is included since this is used as a proxy for the risk-free rate in this study.

According to the OMX Group OMX Stockholm 30 is the leading stock index on the Swedish market. The index is composed of the 30 most actively traded stocks available on the Stockholm exchange. Since the number of companies is restricted to 30 the liquidity is guaranteed for the underlying stocks. The composition of the index is revised biannually (in January and July) and the stocks that have lost too much market cap will have to be exchanged for other stocks that have gained market cap. The index is a market cap weighted index and the base date is 30 September 1986 (OMX Group, 2011). A list with the composition of the index year by year was obtained directly from the OMX Group and can be found in the appendix.

3.8 Market development OMXS30 1989-2010

Below follows three graphs that depicts the index, the index return and the return of a Swedish 3 month T-bill between 1989 and 2009. It is important to note that usually when the OMX index is presented the returns are weighted according to the market cap of each company contained within the index. In order to remove any market cap biases I have rebuilt the index and the annualized returns with each company equally weighted, i.e. the standard arithmetic mean.



Graph 3.1: Stockholm OMX 30 index, equally weighted, rebased at 1989

In the above graph the reader can see the development of the index 1989 to 2010. The actual OMX index starts at 1986 but this index has been given the start in 1989 and the starting value is 100. Why 1989 was chosen instead of 1986 will be discussed in the next chapter.

In graph 3.1 one can see three periods of declining stock growth and three periods of increasing stock growth. The first period with decrease stretches from 1989 to the end of 1992. After that there are two more periods of decrease, namely beginning of 2000 to end 2002 and mid 2007 to start of 2009. The three periods of increase in growth is from start of 1993 to end 1999, start of 2003 to mid 2007 and start of 2009 to end 2010. The periods of growth will later be referred to boom periods and conversely, periods of decrease in growth will be referred to bust periods. The reason for decline in the index has been things such as a housing crash in the late 1980s, the bursting of the dot-com bubble in the 2000s and the Lehman Brothers crash in 2007. To summarize the boom and bust periods can be seen in table 3.3 below:

	1	2	3
Boom Periods	Q1 1993 - Q4 1999	Q1 2003 - Q2 2007	Q2 2009 - Q4 2010
Bust Periods	Q3 1989 - Q4 1992	Q1 2000 - Q4 2002	Q3 2007 - Q1 2009

Table 3.3: Boom and bust periods

Moreover, each period of declining growth followed by a period of increase in growth is labelled as an economic cycle. Therefore, three economic cycles can be found in this study and they are summarized in table 3.4 below:

Cycle 1	Cycle 2	Cycle 3
Q3 1989 - Q4 1999	Q1 2000 - Q2 2007	Q3 2007 - Q4 2010

Table 3.4: Economic cycles



Graph 3.2: Annualized returns Stockholm OMX 30

Above in graph 3.2 the reader finds the returns over time (1989-2010) for the index. Judging by the graph it seems like the return on average would be slightly positive and an increase in return is followed by an almost equally big decrease in return on average.



Graph 3.3: Annualized returns Swedish 3 month T-bill

In graph 3.3 above the reader finds the return for a Swedish 3 month T-bill (1989-2010). Clearly, the interest rate have steadily become lower and lower over time and in the late 2000s the rate was dropped close to zero.

3.9 Summary

Value strategies are based on some form of fundamental analysis whereas momentum strategies try to capitalize on the assumption that trends in the market will continue in the same direction as they are heading right now.

Also, the variables used to distinguish growth stocks from value stocks are the P/E ratio, the P/C ratio, the MTBV ratio and the PEG ratio. All of these variables are considered to indicate a value stock if the ratio is low. If the ratio is high the stock is considered to be a growth stock instead.

Three boom and three bust periods were defined along with three economic cycles that constitute a bust period followed by a boom period.

4 Empirical Analysis

In this chapter a discussion about the data will be conducted along with a presentation of the method used in this study.

4.1 Comments to the data

In this section a presentation and discussion of the data used will be conducted. Here, the origin of the data, its quality and reliability, special considerations concerning the data and limitations of the data is discussed. The purpose of this section is to give the reader an overview of the characteristics of the data used in this report.

The data used in this study comes from Reuter Thomson Datastream 5.0 and this is one of the most popular and highly regarded databases due to its good quality and amount of available data. However, the data quality in Datastream is sometimes not fully satisfactory. There can be missing data points, especially pre 1990, and even though it says data goes back 27 years this might not always be the case.

Originally, this study was aiming to use stocks from the OMXS All Shares Index which includes basically all stocks found on the Stockholm OMX exchange. The reason for not using the OMXS and instead going for the OMXS30 was because issues with data quality. Since the OMXS contains a lot of small-cap stocks with very low liquidity there were many missing data points and some stocks did not even have any data available. The decision was then made to abandon the OMXS and instead opt for the OMXS30 since the latter consists of large-cap stocks with reliable data and high liquidity.

However, the OMXS30 data is far from flawless. There were still some missing data points for a few stocks, generally from the pre 1990 selection, but these were quite few and would have no material impact so the decision was made to use the OMXS30 Index. Moreover, it is believed by the author of this report that the OMXS30 Index has more advantages than disadvantages compared to the OMXS Index. This is partly due to the relatively concentrated Swedish market.

A concentrated market here refers to the fact that the Swedish market actually has relatively few stocks in total but a large part of these are large-cap, from the OMXS30, that drives the total index performance; hence a concentrated market (OMX Group, 2011). Therefore, the advantage of using the OMXS over the OMXS30 in order to draw conclusions from the Swedish stock market as a whole is negligible. Moreover, if the aspects of higher data quality and liquidity also are taken into account, it appears as a sound alternative to use the OMXS30 instead of the OMXS.

Furthermore, Datastream reports data on an ISIN-code level instead of an entity level. This means that, for instance, if a company included in the index changes its ISIN-code due to a merger the time series for this stock ends where the code was changed even though the company is still in the index more or less unchanged. In order to deal with this problem a manual matching and reconstructing of the time series was done where needed in order not to compromise the quality of the study. Since this study uses returns and not absolute price levels the manual matching compromised of simply making sure that if a stock was listed under a different name with twice the price, the return in that moment was zero and not 100%.

A list of constituencies of the OMXS30 Index year by year was obtained directly from OMXgroup and this list goes back to the 18th of December 1986. However, the study could not utilise the full period because of a lack of data from the database when it comes to the interest rate level of the Swedish three-month T-bill. Therefore, the earliest data point actually used in this study is from the second quarter (Q2) of 1989. This should not pose a problem since there are still enough data left for processing. Moreover, including too many data points before 1992 can give the study some unwanted bias since before this date Sweden had a pegged exchange rate and a much different tax regime. These two phenomenon alone can impact the behaviour and rationale of investors so much that drawing general conclusions from the whole time series could be difficult. The study goes all the way from Q2 1989 up to the end of Q4 2010. The end date was chosen simply because a full financial year was wanted and 2010 was the latest available at the time of writing this report. The Swedish three-month T-bill is used in this study as a proxy for the risk-free return. Other risk-free instruments from Germany, Britain or USA could have been used. Still, it seemed rational to use the Swedish one since the study is after all conducted on the Swedish market.

Also, since the number of months for the total period is not dividable by 60, the last, or most recently started, 60 month portfolios constructed will not be complete. The portfolio will end after Q4 2010. However, this should have only a marginal impact on the total result.

Moreover, a few companies that have very volatile return patterns (such as Framtidsfabriken AB; an IT-company that lost most of its market cap in a very short time) can impact the results for a specific portfolio. However, since theses strong positive or negative returns only can make up one eight per portfolio the impact is not considered very significant.

Finally, a test for how the portfolios fared during different states of market volatility was planned but since the shortest portfolio holding period is 6 months it was deemed infeasible to conduct this test. The reason for this is that volatility changes over time very often, so it would be almost impossible to isolate a 6 month period with a specific level of volatility. Isolating longer time periods would be even more difficult.

4.2 Method

In this section there is a presentation of what data is included in the study, how the data was structured and how it was used for calculations. Moreover, there is a discussion of why the data was handled in this way and some pros and cons of this method are also taken into consideration. The purpose of this section is to give the reader a good understanding of how the empirical study was conducted.

In this study all the data from the Swedish market was acquired from the Thomson Reuters Datastream 5.0 database. This is a highly regarded database with good quality in general. Other databases could also have been used such as Factset and Bloomberg but since the data is quite fundamental and simply consists of stock prices and other basic fundamentals there would have been little difference if one database was chosen over the other since they all contain the same

data. Datastream was provided by Copenhagen Business School so it was simply chosen due to convenience.

The report follows the strategies used by Lakonishok et al (1994) in order to investigate whether a contrarian investment strategy in value stocks can yield a greater return than the native strategy of investing in growth stocks on the Swedish stock market. The criteria used to distinguish between growth and value stocks are Price-to-Earnings ratio (PE), Price-to-Cash flow ratio (PC), Market-to-Book Value ratio (MTBV) and Price-to-Earnings Growth ratio (PEG). The stocks with a low ratio are classified as value stocks and stocks with a high ratio are classified as growth stocks. For instance, a stock with a low price compared to its earnings will be regarded as a value stock whereas a stock with a high price compared to earnings will be regarded as a growth stock. These criteria are the same ones used by Lakonishok et al. apart from PEG. They used Growth in Sales (GS) instead of PEG in order to capture stock momentum, i.e. the growth in performance. However, I deemed that PE was a better performance indicator than sales since the former also says something about the company's cost structure. Therefore, it was natural to exchange the Growth in Sales criteria to the PE Growth criteria in order to have a better momentum performance indicator.

The stocks included in this study were taken from the Stockholm OMXS30 Index since these stocks have a high degree of liquidity and data quality as discussed in section 4.1. The constituencies that made up the index year by year were provided directly by the OMX-group and a copy of this list can be found in the appendix. This means that there is no survivorship bias present since all companies are included, even the ones who got delisted during the period of the study. Moreover, companies that changes ISIN, due to merger, take-overs, etc., have been manually accounted for and the old stock time series have been paired with the new time series under the new ISIN, thus creating a time series that is based on entity level and not on ISIN-code level. For instance, the company Astra merged with Zeneca in 1999 to create AstraZeneca. In Datastream, Astra and AstraZeneca have to different time series but these were merged into one single time series so the data could be used over a longer time period.

When the index had been adjusted to the entity level the price data was extracted from Datastream, on a monthly basis, along with PE ratio, PC ratio, MTBV ratio and PEG ratio on a

quarterly basis from start of Q2 1989 to end of Q4 2010. Monthly data for the price was chosen because it gives enough data points to analyse from a statistical point of view. A lower frequency would have made it harder to calculate reliable beta values whereas a higher frequency would not have added much value, only made the data more difficult to handle and to calculate. For the ratios quarterly data was sufficient since Datastream gives the average ratio for the quarter and this was the number needed to conduct the study. Monthly data in this case was simply not needed.

Once the price data was extracted the return quarter by quarter was calculated with the below formula:

$$Return = \frac{P_T - P_{T-1}}{P_{T-1}}$$

Equation 4.1: Stock Return

Where P_T is the price at the time period at hand and P_{T-1} is the price at the previous time period. In this equation the dividends are already reinvested and thus included in the price and companies that are delisted due to bankruptcy get a return of -1. Companies delisted in the middle of a portfolio holding period due to other reasons will simply not give any return and the particular stock will be replaced next time the portfolio is rebalanced.

Next, the stocks from the index were ranked according to their ratios. For instance, the thirty stocks present in the index in Q2 1989 were ranked from lowest to highest PE ratio. This was done for all quarters 1989 to 2010 and all the ratios.

The idea is that the investor should find value and growth stocks by looking at the historical data. If an investor is looking into investing in value stocks that he or she will hold for six months it would be natural to classify a stock that had a low average PE ratio the last six months and 12 months if the holding period is one year. There are no rules or recommendations governing this so there are as many ways of doing this as there are investors. Some might want to look at the lowest PE ratio that particular day and then hold the stock for one year while others might look at an average low PE ratio during the last two years and then expect to hold the stock for just 6

months. However, in this study all stocks, no matter what holding period, will be chosen on an average ratio during the previous three months. The reason for having three months for all holding periods is because there should not be any interference in the results from a variety of holding periods. One can always run multiple tests to find the optimal look-back period but this is not part of this paper's scope and would require so much extra data handling that it is simply not feasible. Also, choosing three months is because this time period gives enough time to classify a stock as either a growth or value stock but not too much time so big fluctuations in the ratios can take place and interfere with the average for the period.

When the ranking of the stocks were done quarter by quarter the returns could be calculated for portfolios consisting of growth and value stocks with different investment horizons. If a certain stock had a very low PE ratio in Q2 1989 then this stock would be included in a values stock portfolio starting in Q3 1989. In other words, every portfolio is based on the average ratio during the previous three months as discussed above. In Q2 1989 the 30 stocks of the index were ranked according to PE ratio and the eight stocks with the lowest ratio and the eight stocks with the highest ratio were used to construct the value and growth portfolios accordingly. The eight highest and lowest ratio stocks from the ranking were used since this is the closest one can get to the 25 percent lowest and 25 percent highest ratio stocks. Actually, 7.5 stocks would be the exact number but since there is no such thing as half stocks it had to be rounded up to eight stocks. On the one hand, some studies simply divided the stocks in two big groups, i.e. 50 percent plus 50 percent. However, when doing this the stocks close to the middle in the ranking would have very similar numbers and therefore the two groups would both contain stocks that are not classified as typical value and growth stocks since their ratios are not significantly low or high. On the other hand, having fever stocks, or smaller groups, would lead to more extreme ratios and perhaps a good representation of very strong value and growth stocks. Unfortunately, then the portfolios would have too few stocks so the middle way was chosen and therefore the portfolios were formed with eight stocks each to balance this problem.

After picking the eight stocks with the lowest ratio and the eight stocks with the highest ratio the yearly returns could be calculated for a 6, 12, 36 and 60 month holding period with a simple buyand-hold strategy for an equally weighted portfolio. These holding periods were chosen in order to give a good spectrum of different investment horizons. More and other holding periods could have been used but a limit had to be set and I believe that the holding periods mentioned would be sufficient in order to draw conclusions about which investment horizon is preferable. Also, please note that the last portfolio of the 60 months portfolios cannot cover the full period since it will end after Q4 2010.

The average of these portfolio returns were summarized holding period by holding period. However, these returns are not risk adjusted and so it would be difficult to draw any accurate conclusion since one type of portfolio could simple yield a greater return due to it having a greater risk, or high beta. Therefore, the returns were risk adjusted using the Treynor Ratio (Brown, 2009). This measures the above risk-free return with respect to the portfolio risk.

$$T = \frac{R_i - R_f}{B_i}$$

Equation 4.2: Treynor Ratio

Where T = Treynor Ratio, R_i = Return on portfolio *i*, R_f = Risk-free return and B_i = the beta of portfolio *i*. The Treynor ratio was chosen over the similar, and more commonly used, Sharpe ratio simply because the data in the models needed less calculations. It is important to note however that there is no downside to using Treynor instead of Sharpe. The two models contain the same information and arrive at the same conclusion in the end anyway.

The risk-free rate was extracted from Datastream as the return on Swedish three month T-bills issued by Riksbanken. These T-bills are usually used as a proxy for the Swedish risk-free rate.

The beta was calculated using the below equation:

$$B_i = \frac{COV(R_i, R_m)}{VAR(R_m)}$$

Equation 4.3: Beta of stock i

Where B_i = beta of stock *i*, $COV(R_i, R_m)$ = covariance between the return of stock *i* and return of the market and $VAR(R_m)$ = variance of the market return.

This gives the beta for the individual stock and the beta for the portfolio is simply the weighted average of the individual betas that make up the portfolio. In this case it is just the average beta since the portfolio consists of equally weighted stocks.

The Treynor Ratio is very similar to the Sharpe Ratio since both gives a risk adjusted return and the reason for going with the Treynor Ratio over the more common Sharpe Ratio was simply due to the fact that the data used made it easier to calculate the former than the latter. Also, since beta was calculated for the portfolios these values were also summarized and will be presented in section 4. The betas of the portfolios are informative to see because the values are quite easy to relate to since many people are familiar whit the concept of beta and can therefore in an easy way interpret the risks of the portfolios.

The risk adjusted returns are presented in section 4 together with the non risk adjusted returns for easy comparison.

Moreover, tests were made to see how the different portfolios fared in boom and bust periods. Therefore, the average return was looked at when the market went up and the market went down. As discussed in section 3.8, there are three major boom periods and three major bust periods, and these are summarized once more in table 3.3 below.

	1	2	3
Boom Periods	Q1 1993 - Q4 1999	Q1 2003 - Q2 2007	Q2 2009 - Q4 2010
Bust Periods	Q3 1989 - Q4 1992	Q1 2000 - Q4 2002	Q3 2007 - Q1 2009

Table 3.3: Boom and Bust Periods

For this test only the 6 and 12 month portfolios were used. This is because the longer holding periods are difficult to contain within a boom or bust period and so would get data from both states. Moreover, after the initial testing the most significant differences between value and growth stocks were for the shorter holding periods and therefore adding boom and bust analysis to the longer holding periods would add limited value.

Furthermore, tests were made to see whether there were any difference between portfolios consisting of value stocks and portfolios consisting of growth stock when looking at a complete economic cycle. The different cycles simply composes of a bust period followed by a boom period. The reason that the starting period is a bust period is because the data used in this report starts in a bust period. If a boom period was the start then there would not be three complete cycles. However, it is important to note that the third cycle is yet not finished at the time of writing this paper so the results from this should not be relied upon too much. The summary of the cycles can again be found in table 3.4.

Cycle 1	Cycle 2	Cycle 3
Q3 1989 - Q4 1999	Q1 2000 - Q2 2007	Q3 2007 - Q4 2010

Table 3.4: Economic Cycles

4.3 Summary

In this study the OMXS30 index is used as basis and the stocks were ranked according to the ratios Price Earnings ratio, Price Cash Flow ratio, Market to Book Value ratio and Price Earnings Growth ratio. The portfolios were formed by taking the 25 % highest (growth stocks) scoring and 25 % lowest (value stocks) scoring stocks. After the portfolios were formed their annual returns were calculated for holding periods of 6, 12, 36 and 60 months. Also, betas for the portfolios were ratio and the risk adjusted returns were compared for the value and growth portfolios over boom and bust periods and full economic cycles.

5 Presentation and Discussion of Results

In this chapter a presentation and discussion of the results will take place. The summarized results from the data is presented and commented on in order to give the reader a good overview, that is easy to understand, of the findings in this report. Firstly, results for the non risk-adjusted returns are presented followed by the results for the risk-adjusted returns. After this, the results for the boom and bust periods along with the tests for the economic cycles are shown. For the risk-adjusted returns, the average portfolio beta will also be presented.

5.1 Comments to results from portfolios

In the graphs and tables below the reader will find summarized findings from the different portfolios constructed. The portfolios were constructed by ranking the stocks on the OMXS30 index according to one of the variables used to distinguish growth from value stocks and then forming portfolios with the 25% highest scoring and 25% lowest scoring stocks. Firstly, the results for the P/E variable will be presented followed by the P/C, MTBV and PEG variables.

The graphs are built in a way so it is easy to compare the returns between the two corresponding portfolios of growth and value stocks. With each graph is a corresponding table that enables the reader to more accurately read the average returns.

What here is referred to value portfolios is, as discussed in chapter 3, portfolios consisting of stocks with low P/E-ratio, low P/C-ratio, low MTBV and low PEG. Conversely, growth portfolios consist of stocks with high P/E-ratio, high P/C-ratio, high MTBV and high PEG instead.

5.2 The results

Firstly the results from the non risk-adjusted returns for portfolios ranked according to the P/E ratio are presented.

5.2.1 Non risk adjusted returns



Graph 5.1: P/E ratio

D/E	Non Risk Adjusted Yearly Returns		
F/C	Value	Growth	
6m	19,98%	18,55%	
12m	18,23%	17,41%	
36m	22,56%	14,66%	
60m	19,78%	17,61%	

Table 5.1: P/E ratio

Visible above is the graph and table that summarizes the non risk-adjusted returns for the portfolios ranked according to the P/E-ratio. In graph 5.1 the average yearly non risk-adjusted return is shown with the shortest holding period to the left and the longest holding period to the right. Following the line and the dashed line the reader can easily follow the difference in return between the growth and value portfolios and how the difference changes over time. The same data is also visible in table 5.1 for more accurate assessment of the returns. Notable here is that the portfolio consisting of value stocks outperforms the portfolios consisting of growth stocks no matter what holding period is looked at. The biggest difference can be seen for the 36 month holding period where the value portfolio outperforms the growth portfolio by 7.9% per year on

average. For 6, 12 and 60 months, the growth stocks outperform the growth stocks by 1.43%, 0.82% and 2.17% respectively.



Graph 5.2: P/C ratio

D/C	Non Risk Adjusted Yearly Returns		
P/C	Value	Growth	
6m	21,24%	17,39%	
12m	18,91%	16,79%	
36m	17,02%	14,18%	
60m	18,95%	19,20%	

Table 5.2: P/C ratio

Above in graph 5.2 and table 5.2 a summary of the non risk-adjusted returns for the portfolios ranked according to the P/C-ratio can be found. Notable here is that the portfolio consisting of value stocks outperforms the portfolios consisting of growth stocks for all holding periods but the 60 month holding period. The difference is most noticeable for the shortest holding period where the value portfolio outperforms by 3.85% per year on average. After that, the gap narrows a little

bit down to 2.12% but rises to 2.84% for the 36 month holding period. For the 60 month holding period the growth portfolio actually outperforms the value portfolio slightly by 0.25% per year on average.



Graph 5.3: MTBV

	Non Risk Adjusted Yearly Returns		
	Value	Growth	
6m	25,12%	18,56%	
12m	20,45%	18,08%	
36m	20,61%	17,76%	
60m	15,83%	17,37%	

Table 5.3: MTBV

Above in graph 5.3 and table 5.3 a summary of the non risk-adjusted returns for the portfolios ranked according to MTBV can be found. Notable here is that just like the P/C-ratio the shorter holding periods have the biggest difference in returns and the longer the holding period the smaller the difference. For the 6 month holding period the value portfolio outperforms quite strongly by 6.56% per year on average. The value stocks outperform the growth stocks by 2.37% and 2.85% for the 12 month and 36 month holding period respectively. For the 60 month 49

investment horizon the growth portfolio outperforms the value portfolio by 1.54% per year on average. Finally, the return for the growth portfolio does not seem to change that much when looking at different holding periods. The average returns just drops slightly as the holding period increases.



Graph 5.4: PEG

DEC	Non Risk Adjusted Yearly Returns		
PEG	Value	Growth	
6m	16,55%	21,85%	
12m	17,76%	23,87%	
36m	17,20%	16,58%	
60m	19,26%	14,02%	

Table 5.4: PEG

Above in graph 5.4 and table 5.4 a summary of the non risk-adjusted returns for the portfolios ranked according to PEG can be found. Notable here is that the PEG variable does not behave like the other variables. It behaves almost in an opposite way compared to the P/C-ratio and MTBV variable. For the 6 month holding period the growth portfolio outperforms the value portfolio by 5.3% per year on average. Looking at the 12 month portfolio the difference has 50

increased to 6.11% and by 36 months the difference have dropped back to 0.62% in favour of the value portfolio. For the 60 month holding period the value portfolio outperforms the growth portfolio by 5.24% per year on average.

5.2.2 Summary

For the portfolios ranked according to the P/E-ratio the value portfolio outperformed the growth portfolio for all investment horizons. Notable was that for the 36 month holding period the difference was as 7.9% per year on average. For the P/C-ratio the value portfolio outperforms most for the shorter holding period and for the 60 month holding period the growth portfolio actually outperforms the value portfolio slightly by 0.25% per year on average. The MTBV variable behaves in a similar way as the P/C-ratio where value stocks outperform in the shorter holding periods and growth stocks outperform for the 60 month investment horizon. In general, for this variable, the growth portfolio does not change much depending on which investment horizon is looked at. The PEG variable behaved almost on the opposite way of the portfolio ranked according to P/C and MTBV. There, the growth portfolio outperformed the value portfolio for the first to holding periods. By the third holding period the difference was very small between the two portfolios and by the 60 month holding period the value portfolio outperformed the value portfolio by 5.24% per year on average.

5.2.3 Risk adjusted returns



Graph 5.5: P/E and Beta

D/E	Risk Adjusted Yearly Returns		Beta	
P/C	Value	Growth	Value	Growth
6m	4,67%	-2,66%	0,32	0,88
12m	9,31%	11,35%	1,01	1,15
36m	12,95%	8,03%	1,10	0,97
60m	13,91%	13,45%	1,02	1,13

Table 5.5: P/E and Beta

Above in graph 5.5 and table 5.5 a summary of the risk-adjusted returns for the portfolios ranked according to P/E can be found. Notable here is that the value portfolio still outperforms the growth portfolio for all holding periods but the 12 month. So, even though the returns are risk-adjusted the P/E variable still seems like a good indicator for superior returns. The biggest difference in returns is for the 6 month investment horizon where the value portfolio outperforms the growth portfolio by 7.33% per year on average. This is to a large extent driven by the significantly lower beta for the value portfolio. However, the beta for the growth portfolio is in

this case still lower than the markets beta of 1 but this portfolio still has a negative risk-adjusted return. For the 12 month holding period the growth portfolio outperforms the value portfolio by 2.04% and for the 36 month period this is reversed and the value portfolio again outperforms by 4.92% per year on average. The difference in returns for the 60 month investment horizon is negligible. Also noteworthy is the fact that the betas stabilize close to 1 for both portfolios for the 12, 36 and 60 month holding period.



Graph 5.6: P/C and Beta

D/C	Risk Adjusted Yearly Returns		Beta	
P/C	Value	Growth	Value	Growth
6m	1,92%	-8,67%	1,43	1,05
12m	15,69%	13,07%	1,21	0,99
36m	10,58%	8,36%	1,10	0,97
60m	15,19%	14,66%	1,10	1,05

Table 5.6: P/C and Beta

Above in graph 5.6 and table 5.6 a summary of the risk-adjusted returns for the portfolios ranked according to P/C can be found. Notable here is that the value portfolio always outperforms the growth portfolio on a risk-adjusted basis even though the former consistently has higher betas. It 53

is interesting to note that for the 6 month holding period the difference in return is as much as 10.59% even though the beta for the value stocks is 1.43 versus a more moderate 1.05 for the growth stocks. In general the difference in returns becomes smaller the longer the holding period is and beta for the value portfolio also becomes smaller. The beta for the growth portfolio stays around 1 for all holding periods.



Graph 5.7: MTBV and Beta

	Risk Adjusted Yearly Returns		s Beta	
IVIIDV	Value	Growth	Value	Growth
6m	7,15%	-10,94%	1,04	1,13
12m	37,29%	19,16%	0,99	0,89
36m	12,96%	16,30%	1,18	0,95
60m	13,06%	12,06%	0,99	1,21

Table 5.7: MTBV and Beta

Above in graph 5.7 and table 5.7 a summary of the risk-adjusted returns for the portfolios ranked according to MTBV can be found. Notable here is that the value portfolio outperforms heavily

for the two shortest holding periods even though the betas are not that different. The value stocks outperforms by 18.09% and 18.13% for the 6 and 12 month investment horizon respectively. After that the growth portfolio outperforms by 3.14% per year on average for the 36 month period and by the 60 month period the difference in returns is only one percentage point in favour of the value stocks. However, in this case the value portfolio has lower beta than the growth portfolio.



Graph 5.8: PEG and Beta

DEC	Risk Adjusted	Yearly Returns Beta		Risk Adjusted Yearly Returns		eta
PEG	Value	Growth	Value	Growth		
6m	-12,66%	13,53%	0,80	1,80		
12m	21,80%	22,23%	1,00	1,11		
36m	12,36%	16,98%	0,95	1,09		
60m	11,01%	11,33%	1,20	0,93		

Table 5.8: PEG and Beta

Above in graph 5.8 and table 5.8 a summary of the risk-adjusted returns for the portfolios ranked according to PEG can be found. Notable here is that once again the growth portfolio outperforms the value portfolio just as in the corresponding case where the returns where not risk-adjusted. For the 6 month holding period the growth portfolio outperforms by 26.19% per year on average. Part of this is explained by the fact that the growth portfolio's beta is more than twice the beta of the value portfolio. For the other investment horizons the difference in returns are much smaller and so are the differences in betas. In the 36 month period the growth strategy outperforms by 4.62% and for the 12 and 60 month periods the difference in risk-adjusted returns is very small (0.43% and 0.32% in favour of the growth portfolio).

5.2.4 Summary

For portfolios ranked according to the P/E-ratio the value portfolio outperforms the growth portfolio for the 6 and 36 month investment horizon. In the shortest holding period the value portfolio strongly outperforms the growth portfolio by 7.33% per year on average largely thanks to a very low beta of 0.33. For the 12 month holding period the growth portfolio outperforms and for the longest period the difference in returns is very small. For the 12, 36 and 60 month investment horizon the beta stays around 1 for both portfolios.

When it comes to the P/C-ratio it is notable that the value portfolio always outperforms the growth portfolio no matter what holding period is looked at even though the former consistently has a higher beta than the latter. The difference in return is at its maximum for the 6 month holding period, where it is 10.59%, but it gets smaller for the longer holding periods.

For the portfolios ranked by MTBV the value portfolio outperforms heavily for the two shortest holding periods even though the betas are not that different. The value stocks outperforms by 18.09% and 18.13% for the 6 and 12 month investment horizon respectively. For the two longer holding periods the difference in returns is quite small and so is the difference in betas.

Looking at the PEG variable it is very interesting to see the there is a strong outperformance by the growth portfolio of 26.19% for the 6 month period. This is partly explained by a much higher beta of 1.9 versus 0.8. For the other investment horizons the difference in risk-adjusted returns and betas is quite small.

Also noticeable is the fact that for the 6 month holding periods the growth strategy produces a negative risk-adjusted return for the P/E-ratio, P/C-ratio and MTBV variable. For the PEG variable the value strategy produces a negative return when looking at the 6 month holding period.

5.2.5 Boom and bust periods

In this section the results from the boom-periods and the bust-periods will be presented and discussed. All returns in this section are annually risk-adjusted returns. The boom and bust periods where defined in chapter 3 but for the reader's convenience the table is reproduced below one more time.

	1	2	3
Boom Periods	Q1 1993 - Q4 1999	Q1 2003 - Q2 2007	Q2 2009 - Q4 2010
Bust Periods	Q3 1989 - Q4 1992	Q1 2000 - Q4 2002	Q3 2007 - Q1 2009

Table 3.3: Boom and bust periods

Firstly, the results for the 6 month holding period are presented followed by the 12 month holding period.

614	Value	stocks	Growth stocks		
OIVI	Boom	Bust	Boom	Bust	
P/E	41,69%	-56,92%	32,76%	-58,09%	
P/C	12,01%	3,66%	38,17%	-78,42%	
MTBV	39,16%	-36,37%	68,35%	-46,94%	
PEG	22,61%	-58,91%	17,03%	76,28%	

Table 5.9: Yearly returns for boom and bust 6 month holding period

As seen in table 5.9 above, the value portfolio with 6 month holding period ranked according to the P/E-ratio outperforms the growth portfolio by 8.93% per year on average in a boom period and it also outperforms by 1.17% in a bust period.

The value portfolio based on the P/C-ratio behaves differently since it underperforms in a boom period by 26.16% but in a bust period it still has positive returns whereas the growth portfolio has strong negative return. This means that the value portfolio outperforms the growth portfolio in a bust period by 82.08% per year on average.

The value portfolio based on MTBV underperforms the growth portfolio in a boom period by 29.19% and it outperforms in a bust period by 10.57%.

The 6 month value portfolio ranked according to PEG outperforms the growth portfolio by 5.58% in a boom period but during a bust period is strongly underperforms by 135.19% per year on average. This is due to the fact that the value stocks have a strong negative return of almost 60% whereas the growth stocks have positive return of more the 75%.

1214	Value	stocks	Growth stocks		
12111	Boom	Bust	Boom	Bust	
P/E	11,69% -6,10%		27,96%	-14,19%	
P/C	24,98% -4,36%		30,37%	-9,59%	
MTBV	34,32%	16,93%	42,50%	-14,88%	
PEG	24,94%	-6,31%	32,99%	2,38%	

Table 5.10: Yearly returns for boom and bust 12 month holding period

For the 12 month portfolios ranked according to P/E the value stocks underperform the growth stocks in boom periods by 16.27% but outperforms by 8.09% in bust periods.

The 12 month P/C value portfolio behaves the same way as the 12 month P/E value portfolio. Only the difference in return between the value and growth portfolio is much smaller in this case for both boom and bust periods. It underperforms by 5.39% in boom periods and outperforms by 5.23% in bust periods.

The value portfolio ranked according to MTBV with a holding period of 12 months underperforms by 8.18% during a boom period compared to the growth portfolio. However, it outperforms in a bust period by 31.81% per year on average.

The PEG-ratio once again behaves differently compared to the other variables. As usual, the 12 month holding period value portfolio underperforms the growth portfolio, in this case by 8.05%, but here the value portfolio also underperforms in a bust period by 8.69% per year on average.

5.2.6 Summary

The value portfolio ranked according to P/E with a 6 month holding period outperforms the corresponding growth portfolio in both boom and bust periods. In the case of a 12 month P/E portfolio it underperforms in boom periods but outperforms in bust periods compared to corresponding growth portfolio.

The P/C-ratio based portfolio with 6 month holding period underperforms during boom periods but manages to keep a positive risk-adjusted annual return during bust periods. This means that it on average outperforms the growth portfolio in a bust period by 82.08%. The 12 month P/C value portfolio underperforms in the boom period but outperforms in the bust period.

The 6 month MTBV value portfolio underperforms in a boom period but outperforms in a bust period. The 12 month MTBV value portfolio also underperforms in a boom period but outperforms in a bust period by 31.81% per year on average.

The 6 month PEG value stocks outperform slightly in boom periods but underperform massively in bust periods by 135.19%. This is due to the value stocks having strong negative return whereas the growth stocks have a strong positive return. The corresponding 12 month value portfolio underperforms in both boom and bust period by more than 8% in both cases.

5.2.7 Economic cycles

In this section the results from the economic cycles will be presented and discussed. The cycles where defined in chapter 3 but for the reader's convenience the table is reproduced here one more time.

Cycle 1	Cycle 2	Cycle 3	
Q3 1989 - Q4 1999	Q1 2000 - Q2 2007	Q3 2007 - Q4 2010	

Table 3.4: Economic cycles

Firstly, the results for the 6 month holding period are presented followed by the 12 month holding period.

6M	Value Stocks		Growth Stocks			
	Cycle 1	Cycle 2	Cycle 3	Cycle 1	Cycle 2	Cycle 3
P/E	5,13%	19,39%	-28,25%	6,38%	-11,54%	-10,77%
P/C	-4,21%	10,40%	2,12%	-21,85%	4,05%	3,62%
MTBV	3,46%	27,47%	-25,88%	16,21%	12,01%	-137,70%
PEG	-16,60%	-18,78%	12,26%	5,25%	-7,07%	82,51%

Table 5.11: 6M returns for economic cycle

The 6 month value portfolio ranked according to the P/E-ratio outperforms the growth portfolio only in the second cycle by 30.93%. During the other two cycles the growth portfolio provides the better investment opportunity. As for the value portfolio based on P/C it outperforms the growth portfolio in the first two cycles but underperforms slightly in the third cycle. The value stocks based on MTBV outperforms in the two last cycles. Notable here is that the growth portfolio has a negative return of 137.70% for the third cycle whereas the value portfolio has a negative return of 25.88%. The PEG value portfolio underperforms in all cycles compared to the corresponding growth portfolio.

12M	Value Stocks			Growth Stocks		
	Cycle 1	Cycle 2	Cycle 3	Cycle 1	Cycle 2	Cycle 3
P/E	8,11%	11,02%	0,59%	10,64%	11,09%	5,23%
P/C	17,10%	12,42%	7,86%	17,23%	11,26%	4,86%
MTBV	50,28%	27,47%	20,18%	35,96%	-2,43%	20,69%
PEG	37,17%	6,29%	-0,86%	28,18%	14,10%	15,48%

Table 5.12: 12M returns for economic cycle

The 12 month holding period for a value portfolio based on P/E underperforms slightly in all cycles whereas the value portfolio based on P/C just underperforms slightly in the first cycle. The 12 month value portfolio ranked according to MTBV outperforms the growth portfolio in the first 60

two cycles but in the third cycle there is basically a tie between the two portfolios. Finally, the PEG value portfolio outperforms in the first cycle but underperforms in the other two cycles.

5.2.8 Summary

There does not seem to be a clear trend or pattern comparing the returns for the growth and value portfolios over the economic cycles. The 6 month MTBV variable has a big deviation for the third and last economic cycle.

5.3 Overview of the summarized portfolio results

In general, the value stocks outperform the growth stocks for the shorter holding periods except for the PEG variable where the opposite occurs. This is true for both the non risk-adjusted returns and the risk-adjusted returns. For the longer holding periods the differences in non risk-adjusted returns between the two portfolios seem to become smaller the longer holding period looked at. Moreover, the 6 month growth portfolio always has a negative risk-adjusted return for all variables except PEG.

The P/E-ratio based value portfolios always outperforms the growth portfolios on average whereas the P/C and MTBV does the same for all holding periods except the 60 month period. The value portfolios ranked according to PEG behaves in a different way and therefore the growth strategy is the superior in this case for the two shortest holding periods. For the risk-adjusted returns the value portfolios based on P/E outperform the growth portfolios for all investment horizons except the 12 month holding periods. The value portfolios based on the P/C-ratio on the other hand outperforms in all holding periods on a risk-adjusted basis. For the value portfolio ranked according to MTBV the returns are higher compared to the growth portfolio for all holding periods but the 36 month investment horizon. Value portfolios based on PEG underperforms the growth portfolios in all investment periods on a risk-adjusted basis. In this case, the growth strategy is the superior one.

The betas for the portfolios do not vary that much when looking at different investment horizons or different variables. There is no clear pattern that can be made out and most betas stay around 1. The only thing that stands out is that the value portfolio based on P/C always has slightly 61

higher betas than the corresponding growth portfolio. Also, the beta for the 6 month P/E value portfolio is very low at 0.32.

When it comes to the results for the boom and bust periods, the value portfolio consistently outperforms in bust periods for both 6 and 12 month holding periods for all variables but PEG. In boom periods the view is more mixed for the 6 month. But for the 12 month the value portfolios underperform constantly in boom periods compared to growth portfolios.

Finally, no real trend or pattern can be gauged from the economic cycles; it seems quite random.

5.4 Comments to the results

Since the 6 month value portfolio outperforms the growth portfolio for all variables but the PEG, a strategy could be used to gain the average difference in return between the value and growth portfolio. The strategy would simply be to buy the value portfolio and sell (short) the growth portfolio (or do the opposite if the PEG is used as basis for stock selection). This would enable the investor to gain the difference in return while having a much lower risk compared to just buying the value portfolio. For example, an investor who creates a value and growth portfolio based on the P/C-ratio would on average get an annualized return of 6.56%, excluding transaction costs. This strategy would also reduce the risk if there is a possibility of a market crash. This is because the growth stocks would fall more sharply than the value stocks would in case of a downturn, as discussed in chapter 2. This strategy could also be used for other holding periods as long as the portfolio that is expected to outperform is bought and the portfolio that is expected to have a lower return shorted.

6 Conclusion

In this chapter the empirical findings and the theory are used to answer the main research question and its sub-questions. The sub-questions will be addressed first and the main question at the end. For the reader's convenience the questions are stated once more and a discussion with following conclusion will follow each question. Once the sub-questions have been answered the main research question will be stated, discussed and concluded.

• What do the standard financial theories say about contrarian investment strategies?

The existence of a value premium on the Swedish stock market can only partly be explained by standard financial theory. According to Efficient Market Hypothesis, no such premium should exist. However, the markets may not be totally efficient since the argument put forward by EMH relies on very strong assumptions. Moreover, markets cannot be efficient since it costs time and money to search for information. If all information is included in the price already, nobody would bother spending time and money looking for information. If nobody is searching for information, prices cannot include the information and thus markets are not efficient.

Also, even if markets were efficient, a value premium could still arise due to the fact that growth stocks performance would erode due to increased competition while the value stocks would have the ability to turn around their company in order to increase growth; as the argument of "looser" and "winner" stocks suggests. Taking all this into account, EMH does not prohibit the existence of a vale premium.

Moreover, the CAPM tries to explain the excess returns for value stocks by assigning them betas that are higher than the betas for growth stocks. This approach fits the model and would at a first glance seem plausible. However, recent studies show, and this paper confirms it, that value stocks in general do not have higher betas than growth stocks (the exception being betas for stocks included in portfolios based on the Price to Cash Flow ratio). This can clearly be seen in the previous chapter.

Also, the traditional CAPM fails to take the whole risk into account since it relies solely on beta as a proxy for the risk. This is further highlighted by the fact that value stocks does not have a greater risk than growth stocks and the former also tend to outperform the latter both in boom and bust periods. Therefore, CAPM does not necessarily contradict a value premium.

Furthermore, as Fama and French argued in 1992 that the additional return of value strategies are driven by the added risk of holding value stocks as opposed to holding growth stock. This would give further indication that perhaps beta is not the best measurement of risk.

Moreover, the statistical concept of mean reversion could explain the existence of the value premium since the low performing stocks would be expected to revert back to the long term trend by improving their performance. Consequently, growth stocks would have deteriorating performance in order to reach their long-term trend. This concept goes hand in hand with the value premium and the research suggests that mean reversion is present on the Swedish stock market.

At a first glance it seems that standard financial theories such as EMH and CAPM cannot explain the existence of a value premium on the Swedish market. However, when looking at the limitations of said theories there might be plausible explanations available. This, coupled with the mean reversion theory suggests that a value premium can indeed be prevalent when standard financial theory is applied. At least, the theories fail to deny the existence of the premium. In order to get a more comprehensive picture of possible explanations, one must turn towards behavioural finance, which will be discussed below in the next sub question.

• If an investor can make abnormal returns through contrarian investments, why is such an inefficient condition present?

According to the standard financial theories, a value premium cannot exist when the assumptions hold. However, the assumptions may not be totally feasible which have been proved empirically.

Considering the theories put forward in chapter 2 there are suggestions of why a value premium can exist in the market.

Irrational investor behaviour such as extrapolation and different agency problems can be a plausible explanation for the existence of a value premium. The extrapolation gives a wrong indication of the stocks future performance and this is after a while corrected so the prices moves towards their fundamental values. Also, investors may be short-sighted and just want quick return and therefore they invest heavily in growth stocks. Moreover, the investors may choose growth stock in favour of value stocks in order to please a superior or a customer. This favour-ism of growth stock tends to increase their prices and reduce the prices of value stocks since they get neglected. After a while the price would revert back to its fundamental value just as in the case of extrapolation when the investors realise the price have drifted too far from the real price.

Furthermore, the disposition effect coupled with overconfident investors may explain why a value premium is existent. The concept of investor overconfidence says that the momentum in stock price increases due to an initial increase. Furthermore, the disposition effect argues that investors sell their good performing stocks too soon which actually decrease the increase in momentum. In addition, overconfidence is in line with the disposition effect when stock prices goes down since the investors tend to hold on to badly performing stocks too long since they expect the price to increase again. Therefore, the price increase of growth stocks is soon impeded and the prices revert back towards its long term trend through the irrational behaviour of the investors.

Also, the band wagon effect is also in line with a value premium since even the rational investors tend to follow the actions of the majority. Once the majority feel that a stock is over-priced or under-priced they will all start to reverse their trading pattern and start to buy value stocks and sell growth stocks and thus bringing the prices closer to their fundamental values.

In addition to the above theories, I believe that a combination of the band wagon effect and the fact that a lot of investors know about the value premium can be sufficient for such a phenomenon to exist. It would also explain why the biggest differences in returns between the growth and value portfolio are found for the shorter holding periods. The reasoning would be that once a stock starts to move upwards the rational investors would "hop on the band wagon" and

buy the stock that is moving upwards. Since they are rational they know that this upward trend will only last for a short while before other investors will get out of the stock and so the trend would be reversed. I.e. once the stock reaches a certain, unknown, price more and more investors would sell the stock to recoup their gains. Therefore, the stock price would start to fall and the new band wagon effect would be to sell the stock since everybody else is doing it. The rational investors know beforehand that this will happen but they do not know when. So, they would go with the upward trend as long as they feel that sufficient amount of investors keep doing the same. Meanwhile, they keep their fingers on the sell button in order to be able to get out of the stock before everybody else does.

Once, the trend of rising price is broken many investors will be quick to sell or short the stock. Now, they have the problem of finding a new investment opportunity for the proceeds coming from the sale of the stock. At this point, the value stocks which seems reasonably priced (and may even have been neglected, due to the focus on the stocks with rising prices, which makes them even cheaper) turns into the obvious choice for the rational investors. So, the investors start to buy the value stocks and now the band wagon effect increases the rise in prices even more for the value stocks while at the same time the growth stocks keep falling.

The above would continue until the cheap value stocks would have become so overpriced that the trading pattern once again reverses. Also, at this point the former growth stocks would have become relatively cheap by now which make their prices go up

Moreover, I believe that since investors are aware of the existence of a value premium a self fulfilling prophecy may be present. This self fulfilling prophecy would be there due to investors aware of the value premium would buy value stocks and short growth stocks in order to make a profit. The profit would be the difference in return and it would come with a rather low risk since value stocks outperform growth stocks even in boom and bust periods (as showed in this study and other previous studies as discussed earlier in this paper). If investors engage in this type of behaviour at a sufficient scale the prices of value stocks would rise and growth stocks would fall. The more investors that do this the more apparent would the existence of a value premium become and so even more investors would engage in the trading pattern and making it even more apparent; hence a self fulfilling prophecy.

As stated above, I believe that the band wagon effect and the awareness of a possible value premium could alone be the explanation for the existence of the premium. All in all, this coupled with the theory from the behavioural finance discussed in this section, and the fact that the standard financial theories do not contradict a value premium, makes it quite plausible that such an inefficient phenomenon as a value premium may be prevalent on the Swedish market

• Which of the fundamental variables Price/Earnings, Price/Cash-flow, Market-to-Book Value and Price-Earnings-Growth should be used as indicator for possible higher risk-adjusted return, if any?

Looking at the results from the data in the previous chapter, a good answer to the above question would be that all variables can be used to indicate higher risk-adjusted returns. What is important to consider is whether a value or growth strategy should be followed and what holding period is preferable.

For portfolios based on the Price to Earnings ratio, a value strategy would yield higher riskadjusted returns compared to the corresponding growth strategy for all investment horizons used in this study, except for the 12 month horizon. When the Price to Cash Flow ratio is used the value portfolios always outperforms the growth portfolio. A similar pattern can be seen for the Market to Book Value ratio where the value strategy outperforms for all holding periods but the 36 month period. For the Price Earnings Growth ratio the growth strategy is the superior one compared to the value strategy. Following the former would yield higher risk-adjusted returns in all holding periods. Furthermore, when looking at boom and bust periods the variables can be used to indicate how the two different strategies would perform during certain market situations. For instance, the growth strategies for the P/E-ratio, P/C-ratio and MTBV variable would for the short holding period always yield negative risk-adjusted returns during a bust period which a value strategy would not.

Also, on average, if a value strategy is followed (for P/E, P/C and MTBV) the returns tend to be higher compared to the growth strategy when the market is in decline, as showed in this study. This is also in line with the previous papers of Bernstein (2000) and Lee et al (2009).
To conclude, all variables can be used as indicators for possible higher risk-adjusted returns, especially for the shorter holding periods.

• Assuming contrarian investment strategies yield abnormal returns, what invevestment horizon is then preferable?

Looking at the data presented in the previous chapter the biggest difference in returns in favour of value stocks is the shortest investment horizon of 6 months. This is true in the case of portfolios based on the P/E-ratio, the P/C-ratio and the MTBV variable. Portfolios based on PEG also has the biggest difference in returns for the shortest holding periods but here it is instead the growth portfolio that has the greatest return. For the longer investment horizons the differences in returns are much smaller and they also tend to diminish the longer the period is.

However, since transaction costs go up for the short holding period, as discussed in chapter 2, the size of the transaction costs matter when a definite answer should be given whether time horizon is optimal. Considering how low transaction costs are in general, it can be safe to assume that the shorter holding periods still will yield a greater return.

The reason for the shorter holding periods having the biggest difference in returns could be, as argued by in the second sub question above, that a lot of investors are aware of the possible existence of a value premium and therefore they act on it. They are quick to use the band wagon effect in order to go with the market in upwards trend but also quick to exit the growth stocks and buys the value stocks when there is a perceived maximum. This phenomenon would occur at a reasonable high speed and this could explain why the shorter holding periods face the biggest differences in returns.

Judging from the above, there is indication that the Swedish stock market mean reverts quite quickly so a short investment horizon of around 6 months is preferable.

Main research question:

<u>Can a contrarian investment strategy in value stocks yield a higher risk adjusted return</u> <u>compared to a conforming investment strategy in growth stocks on the Swedish stock market?</u>

Considering the sub-questions, the available theory and the empirical findings of this study, one can indeed conclude that a contrarian investment strategy in value stocks would on average yield a higher risk adjusted return than an investment in growth stocks on the Swedish market. These results are also in line with previous studies made on this subject.

6.1 Further research

Further research that may be done on this subject could be adding the small cap and mid cap companies to the empirical analysis in order to investigate whether a value premium exists not only for the large cap companies. Moreover, more investment horizons could be added to make picture even clearer of which holding period is the optimal. Finally, a more elaborate measurement of risk could be used instead of beta.

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Appendix

OMXS30 constituencies

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Asea B fr	Bilsped B	Atlas			Asea B fr	Lundbergs B			Stora fr	Pharmacia B	Artimos	Astra B fr
Astra	Industri	Munksjö			Astra fr	Sandvik A			Lundbergs B	Volvo A	Proventus B	SCA B fr
Astra fr	SHB	Skåne-Gr. B			Volvo A	Asken			MoDo B fr	Boliden A	Sandvik A	Lundberg B
Atlas					Sandvik B	Industri			Munksjö A	Proventus B	Sydkraft C	Munksjö A
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Volvo B												
Volvo B fr	SCA B fr	AGA B fr		Match B fr	Asea B fr	SCA B	SCA B	Pharmacia	Trelleborg B	Astra B		Skandia A
Boliden A	Saab B fr	Asea B fr			Astra B fr	Alfa B fr	Alfa B	Saab B	Avesta	Stora A		
Lundberg B	Arcona A	Artimos			Pharmacia	BArcona	Carnegie ,	'AGA B	Bilsped B	Alfa B		
Munksjö A	Munksjö A	A Sandvik A			AGA B	Munksjö A	Carnegie I	AGA B fr	Esselte B	Carnegie A		
Proventus B	Skåne-Gr. I	E Sandvik B fr			AGA B fr	Skåne-Gr. B	Lundberg	Marieberg	Munksjö A	Carnegie B		
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6	Added	Nobel B fr Hennes B fr Incentiv B fr	16	Added	Avesta A MoDo B Parmacia A
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9	Added		<u>1</u> 6	Added	
20707	Removed	Trelleborg B	51106	Removed	Pharmacia A Pharmacia B
92	Added		96	Added	Autoliv Sparbanke Kinnevik I
0731	Removed	SCA B	0102	Removed	Incentive B en A B
26	Added		96	Added	Parmacia I
1005	Removed	Procordia B	0701	Removed	Celsius B
930	Added	AGA B Gambro B fr Investor A fr SHB A fr Sydkraft C Esselte B fr	970	Added	
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