Rationality of Individual Investors: The Case of Placera

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Acknowledgement

We would like to address a thank you and our gratitude to those people who have helped us and contributed to this thesis. Starting off with thanking our supervisor Catherine Lions for the support, feedback and guidance throughout the whole thesis. Secondly a thank you to our partner Placera and their Editor-in-chief Gunnar Wrede for a fruitful partnership. We are also thankful for the feedback and support from our colleagues. We would also like to express our gratitude to Johan Svensson and Jörgen Hellström for support in statistics during the thesis.

Finally we would like to thank each other for a well performed thesis and memorable semester.

Abstract

This study addresses if it is rational for investors to follow analyst recommendations. Considering how easy it is for an individual investor to get fooled to believe that experts pursuing active strategies fare better than passive strategies and indexing. Also factoring in the theory of efficient markets would contradict that recommendations can ever yield a long term abnormal return. This is because if the theory holds then analysts make their valuations upon information already priced into a stock which cannot lead to consistent abnormal profits. This calls to question whether analysts actually beat the market index. In the search for possible explanations for investor and analyst behavior finance played a large role especially the concepts of overconfidence, anchoring and herding.

This is researched through a case study on Placera, one of Sweden’s largest business websites, using a quantitative method. The study compiles and segments approximately 450 recommendations between 2011-2012. Segmenting is done based on firm size and buy or sell, along with testing for possible relationships between trend of the stock prior to its recommendation and its return and risk level and return. In this way Placera’s analysts’ performance is thoroughly analyzed and tested.

What the research shows it that Placera analysts do no beat the market, therefore it is not rational to follow their recommendations, passive strategies primarily indexing is a much better choice. Through the application of behavioral finance concepts we found that analyst are likely overconfident as the characteristics match up almost flawlessly. Theory also suggests that this irrational behavior of investors and overconfidence of analysts affects the market as it decreases market efficiency. Segmenting showed that firm size is not an issue, the analysts’ performance did not vary significantly based on if the recommended stock was a Large, Mid or Small Cap stock. The commonly seen anomaly where Small Cap recommendations generate superior returns was thus not seen. However a clear factor to consider is whether the recommendation is to buy or sell as the sell recommendations vastly outperformed the buy recommendations. A relationship between the trend prior to the stock and its return was identified as a significant negative correlation exists between them. The relationship indicates how a negative trend prior to the stock’s recommendation leads positive returns and vice versa. The risk level of the stock on the other hand is not related to the stock’s abnormal return and can therefore be disregarded by investors in their decision whether to follow a recommendation.
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Chapter 1: Introduction

The introduction chapter starts by introducing the problem background which then leads to the research question. This is followed by the purpose and limitations of our thesis. Next we describe the research gap and our contributions. The last part of chapter 1 contains the disposition.

1.1. Problem Background

Today there is a lot of controversy around the Efficient Market Hypothesis and many even blame the hypothesis for the current recession. However we also observe that there is a big market for recommendations and for recommendations to have any value at all the market must be to some extent inefficient. The randomness of stock prices was observed by Maurice Kendall in 1952. He described the series as a wondering one and “almost as if once a week the Demon of Chance drew a random number from a symmetrical population of fixed dispersion and added it to the current price to determine the next week's price.” (Kendall, 1952, p.13).

Thus the foundation for the Random Walk Hypothesis was established. Based upon the random walk hypothesis and fair game theory, Eugene Fama laid out his famous theory of Efficient Markets. An efficient market was defined as “A market in which prices always "fully reflect" available information” (Fama, 1970, p.383). In such a market, stock prices will reflect true firm value but to different degrees depending on the form of efficiency taken into account. Thus in an efficient market investors cannot earn abnormal profits and beat the market without an informational advantage in the long run. In an efficient market investors are competitive, they seek to maximize their return, they attempt to foresee the future intrinsic value of stocks and they all have access to vital recent news. Moreover, investors in an efficient market are rational. (Fama, 1995, p.76)

Vriend defines economic rationality as: “Rationality in economics means that an individual agent chooses (one of) the most advantageous options, given his preferences, in his perceived opportunity set.” Vriend also adds: “such that all perceived costs and benefits are taken into account; in particular, information, decision-making and transaction costs” (1995, p.268-269). Irrationality is then the opposite of this concept. When people make non-optimal choices given their set of preferences.

However contrary to what the EMH would suggest an abundance of stock analysts, brokers, banks and fund managers exist and flourish. These agents and institutions continuously publish and present stock recommendations. Their impact can in some cases be seen instantly on the price of a stock. One of the largest and most visited analytical firms in Sweden is Placera.nu, a subsidiary owned by Avanza Bank. Avanza is today the most popular place in Sweden for Swedish investors to trade stocks and funds. Placera is the third largest business website in Sweden with over 200 000 unique visitors per week. They will provide us for this thesis with a large database of buy and sell recommendations, in which Placera recommends that investors buy or sell a certain stock, with a 6 month investment horizon based on fundamental analysis. These recommendations are public and the main audience is individual investors. These are
individuals and not professional institutional investors, they invest their own money and are in general less skillful and less educated. (Avanza, 2013a)

The existing quantity and constant publication of recommendations along with research on the topic shows that this type of investment advice is being followed. The amount of recommendations and the people that the recommendations reach has increased recently. This is mainly due to the evolution of the internet allowing for instant mass spreading of information and bring great ease to trading stocks. This improved spread of information should increase market efficiency, as information spreads faster to market participants prices will adjust faster. Do these imitating investors then expect that following individual stock pick recommendations will result in abnormal profits and them beating the market? If not, a rational investor would surely, save time, transaction costs and effort and simply buy the index. If the market is efficient the investors following recommendations cannot rationally expect to beat the market. But if these recommendations are being followed are investors then truly rational? A key assumption of the efficient market hypothesis fails if investors were not to be rational.

Presently, opinions are greatly divided and there is a lot of disagreement regarding the efficient market hypothesis. The criticism put upon the hypothesis centers around how in an efficient market where all information is reflected in a stock price, the price of a stock equals its value. Therefore with efficiency there would be no over or undervalued companies and consequently we would see no bubbles, crashes or non-rational valuations. Yet, again and again, crashes and bubbles arise and have been far more extreme than the cyclical effects of the recurring business cycle. The overconfidence in the theory is at its most extreme when the apex of a bubble begins loom people continue to buy blindly. These are events which do not comply with the fundamentals of the efficient market hypothesis. Critics thereby blame the hypothesis for causing people to underestimate the impact, probability and frequency by which these anomalies will occur. Recently we saw the prices of houses, stocks and other assets soar far above their intrinsic value and then coming crashing down – leaving very many with very little.

Several prominent economists have expressed themselves on this matter. Among them is Jeremy Grantham a market strategist proclaiming that the efficient market hypothesis is the primary reason for the present recession because it has led to a “chronic underestimation of the dangers of asset bubbles breaking” (New York Times, 2009). Already back in 1984 Robert Shiller who was a professor at Yale described the efficient market hypothesis as “one of the most remarkable errors in the history of economic thought.” (The Globe and Mail, 2009). Ex Federal Reserve chairman Paul Volcker claimed that: “It should be clear that among the causes of the recent financial crisis was an unjustified faith in rational expectations, market efficiencies, and the techniques of modern finance” (New York Books, 2011). Roger Lowenstein who is a financial journalist and writer expressed his firm opinion as he said “The upside of the current Great Recession is that it could drive a stake through the heart of the academic nostrum known as the efficient-market hypothesis.” (Washington Post, 2009).

These issues have fortunately seen a lot of research and many different anomalies have been found. These anomalies highlight different inconsistencies within the efficient market hypothesis. These are anomalies such as the Day of the Week effect, January effect, Turn of the Month effect, Bubbles and Crashes and many others which cast some doubt upon the validity of the efficient market hypothesis. Later on more modern
research began to incorporate psychology into finance to study the behavior of investors. This developed into behavioral finance, which furthers the preexisting qualms regarding the hypothesis.

Perhaps these types of anomalies which directly counteract the efficient market hypothesis can be explained by concepts within behavioral finance. If investors and analysts suffer from overconfidence, that people overestimated the accuracy of their predictions and knowledge then this could help to explain why people believe that they can beat the market (Odean, 1998, p.1892). In fact, research has shown that overconfident investors hold undiversified portfolios (Odean, 1998, p.1889). This would fit within the characteristics of analysts picking individual stocks and of investors following such recommendations. Overconfident investors will decrease market efficiency as they are overconfident in their skill of analyzing public information and when investors are rational market prices are controlled by a “single driver”, while irrationality will introduce a “second driver” which will increase price volatility and distort prices. (Odean, 1998, p.1891, 1916)

Behavioral finance also explains bubbles, primarily with the concept of herding behavior. The effect of herding can even be seen when for example when Warren Buffett buys a stock and this new reaches the market, the price on that stock will rise, due to this leading to that other people also buys the stock (Hirshleifer & Teoh, 2001, p.1). The publication of recommendations of analysts cause herding as herd behavior is defined as “an obvious intent by investors to copy the behavior of other investors” (Bikhchandani & Sharma, 2000, p.281). Within this behavior a very important moment is the first action taken, as it may set the direction of the whole herd, which may be precisely what the analysts contribute with in their recommendations.

Behavioral finance has also introduced the concept of investment anchoring of which there is surprisingly little research done. The behavior of anchoring is explained as following: when people make an estimate they are likely to have a reference point and then they make an adjustment from this reference point. Thus people anchor their estimate and decision on this reference point which can be completely arbitrary and irrational. (Thaler & Barberis, 2002, p.14). Phenomena seen by Odean, when he analyzed the trend of a stock before it was purchased or sold by an investor, was that investors “sell securities that have on average risen rapidly recent weeks” (Odean, 1999, p.24). They also short sell a greater quantity of stocks which have prior to the transaction had a bullish trend. Furthermore investors were inclined to buy stocks which have had an even more extreme development the last 6 months than the stocks that they sold. Odean suggested that this behavior was due to the numerous amount of stocks available making it difficult for investors to systematically scrutinize them all. Instead investors buy or sell stocks that catch their attention, and one of the best attention draws is the stocks’ trend. Thus investors anchor their investment decision based on the stock’s trend prior to their purchase and use it to motivate their decision. Yet the rationality of this behavior is yet to be analyzed. (Odean, 1999, p.24-25).

These concepts within behavioral finance all strive to develop our understanding of investors’ behavior. All of the concepts stray away from the supposition that all investors are fully rational, instead they portray a more dynamic and realistic human. Full understanding of the relative rationality of investors and their behavior is perhaps impossible. However a furthering of our current knowledge is both achievable and
needed within this subject. Investors may be fooled in following recommendations altogether believing they will realize an abnormal return from doing so, as economist and author Burton Malkiel said: “A blindfolded chimpanzee throwing darts at the Wallstreet Journal could select a portfolio that would do as well as the experts.” (2003, p.60)

1.2. Research Question

The efficient market hypothesis is heavily researched yet all of these controversies and divided opinions about the theory remain, calling for further research and from new perspectives, especially after the recent financial crisis. Furthermore, investors are constantly coming in contact with recommendations from professionals and may be tempted to follow these. In an efficient market, all available information is already reflected in the price of a stock and therefore the investor would not be able to beat the market and make an abnormal profit by following the analysts’ recommendations. This study will examine if it is rational for investor to follow recommendation and thereby examining the rationality of investors. Investors acting rationally is an essential assumption for the EMH and consequently we ask the following research question:

Are individual investors rational by following analysts’ recommendations for Swedish stocks?
- The Case of Placera

1.3. Purpose

The aim of this paper is to answer the stated research question and through the analysis of it draw conclusions about investor and analyst behavior and strength of the EMH’s assumption of rational investors.

The study will compare the imitating investors’ total return to the market return, and then we will segment our sample as follows: First, the returns of small versus mid versus large size companies will be compared. Second, the performance of buy versus sell recommendations will be examined. Third, will be an investigation be of the trend of the stock prior to the recommendation made. The returns will be divided depending on whether the stock was in a bearish or bullish trend prior to the publication of the recommendation. This will lead to an analysis of anchoring. Examining whether it is more or less rational to anchor the investment decision based on a specific trend prior to the recommendation. Fourth and finally, an analysis will be done exploring for possibilities of a relationship between the risk level of recommended stock and its realized. Researching these issues will make it possible to analyze the rationality of following professional recommendations through many different aspects.

The outcome of the study is interesting as there is a paradox both if the recommendations beat or are beaten by the market. If the recommendations beat the market, then investors are rational when following recommendations however the market is not efficient in terms of these recommendations as they are seeing consistent abnormal profits. One the other hand if the recommendations are beaten by the market, then investors are irrational when following recommendations and instead the rationality assumption of efficient markets fails. Consequently our research will also
come to analyze what implications this paradox may have for the efficient market hypothesis.

The research will also allow for an in-depth and conceptual analysis of the analysts’ performance. For example, as mentioned earlier analysts display many characteristics of being overconfident therefore a review of their performance is necessary to investigate this further.

1.4. Limitations

The first limitation of our study is our time horizon which will be slightly over two years covering 2011-01-07 to 2013-03-18. A two year time frame will allow for a significant sample and at the same time does not jeopardize the completion of the study in time. Also going too far back in time approaching the period of the financial crisis would increase the risk that the crisis would heavily distort the study.

The second limitation is that our research is country specific. All recommendations will be of Swedish companies and therefore the Swedish stock index will be used for comparison. It was necessary to restrict the research to one country, otherwise the sample would be very feebly scattered across the globe resulting in definite statistical insignificance. Choosing Sweden allowed for a collaboration with Placera and for us to utilize the knowledge we have within this market.

The final limitation is that our study will examine the decision of individual investors which excludes professional institutional investors and corporations. Since analyst recommendations are targeted towards individual investors, these are the subjects we wish to study. Institutional investors are educated professionals who are very unlikely in need of investment advice and therefore not relevant when studying recommendations.

1.5. Research Gap

Within heavily researched areas such as efficient markets and behavioral finance, unique angles and approaches will bring the most amount of new knowledge and broaden these fields. Our approach to examining investor’s behavior has not been carried out before. Many limitations and exceptions of the efficient market hypothesis have been exposed by behavioral finance. This has caused a spreading of disbelief in the hypothesis, yet it continues to stand relatively strong and many even attribute blame towards the EMH for its causation in the recent crash and recession. Such a broad theory naturally rests on several assumptions without which it does not apply. Consequently further evaluation and testing of these assumptions is vital to further dissect and expose the hypothesis. Information society has brought an instant spread of information, making markets more efficient but also increasing the access and quantity of recommendations. Thus a modern approach which combines recommendations, behavioral finance and the efficient market to evaluate rationality will fulfill a present gap within the current pool of research.

Many articles have compiled and compared the returns of analysts’ recommendations and a benchmark index. However further categorization of these recommendations is yet to be seen. The most interesting categorizations from our perspective is to classify
stocks depending on their size to see if analysts perform exceedingly well or poorly depending on the firm size. Furthermore it has not been seen if the relative risk taken by the analyst makes a difference in the performance of the recommendation. Within the concept of anchoring there is not much research done and to evaluate the rationality of anchoring is yet to done. Finally a comparison of performance between buy and sell recommendations, will at the least provide updated information and a new sample to the current data.

1.6. Contribution

Our research aims to contribute to the field of business administration both theoretically and practically. In terms of theory, studying and evaluating rationality of investors will contribute to the current theoretical knowledge about this vital issue. Since the rationality of investors is an essential assumption of not only the EMH but also many other major economic and financial models. Therefore depending on the result of the study it may lead to question these popular models. This paper will also add to the rather small amount of research done on anchoring. It will contribute with country specific research as our study is done purely within Sweden.

The practical contributions of our work will be applicable for many different market participants. Investors will be enlightened with a summarization of analysts’ performance within different categories of stock sizes, risk levels, recommendation types and trend prior to the recommendation. Providing these people with a researched basis which they can apply when deciding whether or not to follow recommendations. Also to sort and categorize recommendations by their expected profitability based on past performance and use this information to follow only the recommendations where analysts’ have proved themselves previously. Analysts will receive an overview of their performance, within different categories, which can then be used to evaluate themselves and they can see where their relative performance in these categories. These analysts’ can then focus more on areas where they excel and thus improve their overall performance and perhaps alter their strategy or method for the categories where they perform poorly. This work will bring new and fresh data to the area as our sample is very recent.

Another direct contribution will be made to Avanza bank and Placera.nu who we have collaborated with in this work. They will receive a summary of their performance compared to the OMXS GI (Gross Index) over the selected time horizon and they will publish our result later this summer.

1.7. Disposition

Chapter 1: Introduction

This chapter contains an introduction to this research paper, starting off by introducing a problem background. This then leads to a research question, followed by a purpose and limitation of this research. The next part is the description of the research gap and the contribution of this thesis. The final part presented in chapter 1 is the disposition.
Chapter 2: Research Methodology

This chapter describes the structure of the research and how our research will be conducted. Starting with how we chose our subject, our preconceptions, and the perspective of this study. Next up we describe our research philosophy, approach, strategy, and design together with argument for the chosen method. These parts are followed by a review of our time horizon, data sources, literature and the quality of our research. The final part of the chapter contains ethical and societal issues related to our research.

Chapter 3: Theoretical Framework

This chapter presents theory, literature and previous research relevant for our research. The first part outlines necessities such as the Swedish stock market, individual vs. institutional investors, analysts, Placera and stock recommendations. Next we present previous research, a study of Swedish stock recommendations, and recurring phenomena. This is followed by a short introduction of portfolio theory. Then we describe the Random Walk, the Efficient Market Hypothesis and their anomalies in a chronological order. Next we introduce Behavioral finance with rationality and irrationality and concepts developed within Behavioral finance. The final part consists of the formulation of our sub-research questions.

Chapter 4: Practical Methodology

The aim of this chapter is to present the practical part of our research method. It starts by describing our sample, time horizon, data collected and collection method. Next we present the statistical test that will be used, followed by the assumptions and limitations of these tests. The final part of the chapter is a formulation of our hypotheses.

Chapter 5: Empirical Results

This chapter presents the empirical results of our study. Starting off with the simple returns from the total amount of recommendations, as well as the different categories. The next part contains results from normality tests within the different segments of our sample. This is followed by tests of significance, using t-test and Wilcoxon test. The last part contains the results of correlations tests for Trend and Beta.

Chapter 6: Discussion

Chapter 6 will contain the answer of the research question and the sub-research questions. This will be done by accepting or rejecting the hypotheses and then a discussion. Starting off with answering the research question concerning investors’ rationality, then if analysts’ performance is dependent on firm size or dependent on buy vs. sell recommendations, finally if trend or beta have a correlation with the return of the recommendation.
Chapter 7: Conclusions

This chapter concludes the research paper and provides suggestions. We start with concluding the results of our research. Next we evaluate our paper through our purpose, research gap and contribution. We finish this chapter by providing suggestions for further research.
Chapter 2: Research Methodology

The aim of this chapter is to describe the structure of how the research will be conducted. We consider every approach and method possible, every choice and action we take is then motivated and argued for as carefully as possible. First is it described how the subject was chosen, what preconceptions may exist and the perspective of the study. This is followed by a review of each research philosophy, approach, strategy and design along with an argumentation for the applied method. After that we outline the time horizon and critically evaluate the data used, the literature used and the quality of the research. To conclude this chapter we consider relevant ethical and societal issues associated with our research.

2.1. Choice of Subject

We chose this subject because both of us have a strong and prolonged interest towards finance and specifically the stock market. Together we have a combined experience of over 10 years of trading stocks actively. Through studying the International Business Program we have gained a thorough theoretical understanding of the stock market and significant international experience. Supplementary to our studies we have taken classes provided by Unga AktieSparare (Young StockSavers) within both fundamental and technical analysis. Furthermore we have been active within and attended meetings at HHUS Finance Ministry. Evidently our interest for the stock market stretches much further than merely our studies and is a noteworthy part of our spare time.

How we chose the subject was also influenced by the company we are working with. We felt a strong inclination to work in collaboration with a financial institute. This is to further our practical contribution and to build business relationships. To be able to work with Avanza Bank through Placera was a great opportunity to achieve this. Both of us feel that working as an analyst or trader is a potential future career and thus it is very interesting to be able to work in association with this company and in this business.

Our choice was further reinforced by a genuine interest in the results of our study. Especially as we come into contact with Placera’s recommendations on a nearly daily basis. Therefore it would be very interesting for us to assess Placera’s performance. It is also exciting to see the outcome of our analysis within behavioral finance of investor behavior. Since we ourselves participate and interact on the financial market actively it will be great to get a deeper understanding of our own behavior as investors and of course also the behavior of other individual investors.

The procedure of selecting a topic to work with relied heavily on the type of theories we would be able to study. The theoretical concepts which cover our study are theories which we have encountered throughout our studies. We have both experienced these concepts as some of the most interesting notions we have encountered within our university program and consequently feel a desire to develop our understanding of them.

Lastly, when choosing our subject it was of course essential that the topic was relevant to our field of research. Our subject is undeniably relevant to the field of business administration within which we write our thesis and centered in finance which is the
Master’s Degree we will attain. Our main concepts lie within behavioral finance which strives to explain investor’s behavior in the financial market and consequently has a clear connection with our field. The supplementary theories are mainly concerned with market efficiency which is also a major theory within this field. We also study and incorporate actors on the financial market, primarily investors and analysts. The issues in our study are all evidently interrelated and comprised within the field of business administration.

2.2. Preconceptions

“By characterizing individuals as subjects in subject–object relationships with everyone and everything around them it makes sense to propose that individuals must have beliefs about what is true or false in their objective world.” (Ryan, 2002, p.10). One perspective is that the origins of such beliefs are from the individuals’ preconceptions regarding the objects they are opposed with.

Our previous experience of the stock market and our studies may have formed preconceptions over the years. This interest was also the main motivational source for us to this study. Since Placera is a website that we came in connection with almost daily, it felt intriguing and interesting to work with them. We have to be aware of that the knowledge we acquire from prior research may enhance our preconceptions. Therefore it is important to review this openly but also critically while also assuring that the highest quality research is being reviewed. As well the fact that we are Swedish and cultural perspectives can affect the researchers’ preconceptions. Although this risk seems dismal as both researchers have extensive international experience and are studying an international university program. Greatly reducing the risk of bias in the study is adjustments we make owing to the continuous feedback we receive from our supervisor and colleagues.

We do have a strong interest in the results which our study will yield, therefore we need to be aware of our preconceptions. For us the interest in the results is completely obscured if the study is not correct and objective since then the results are invalid. Neither are we employed or compensated by Placera. Instead acting professionally and striving for accuracy will give us the greatest benefits.

2.3. Perspective

The perspective of our study aims to describe the viewpoint and angle which we have chosen. The study is interesting for regulators, researchers, analysts, and investors, but as our research question indicates we will center our research on individual investors. The results and conclusions of our study will assist these individual investors in evaluating the potential value in following recommendations. Furthermore the behavior of individual investors and analysts will be examined using behavioral finance.

Through our assessment of rationality this study will also direct itself towards any institute, actor or person who works with or studies financial theories which assume rationality of investors. By merging everything mentioned, our perspective is certainly broad. But main focus is on Individual investors along with Placera’s analysts.
2.4. “Research Onion”

The research “onion” presented by Saunders et al displays the structure of our research methodology. Starting of with research philosophy in the first layer. The second layer of our research methodology consists of our research approach displaying the relationship in our study between theory and research. Next is our type of study followed by our research design, the purpose of our study and how to carry it out. Our research strategy lays within the heart of the onion, displaying in which way we collected and analyzed our data.

![Research Onion Diagram]

**Figure 1:** Research “Onion”  
**Source:** Saund er et al, p. 83 (2003)

2.5. Research Philosophy

The researchers’ philosophical views will affect how the studied area is approached, and thereby help the researchers to achieve the best possible results. Two main philosophical areas exist: Ontology and Epistemology. Ontology displays how the researchers view the nature of social entities and their relationship to social actors. Through epistemology it also displays the way they assess knowledge and what is acceptable knowledge, as well as the differences between the study of social and natural science. These are the two main areas in research philosophies, which will have an
important effect on how the study is structured and conducted. (Bryman & Bell, 2011, p.15, 20)

2.5.1. Ontology

“An ontology is an explicit specification of a conceptualization. The term is borrowed from philosophy, where an ontology is a systematic account of Existence.” (Gruber, 1993, p.1). It reviews whether reality exists objectively from social actors or if reality is created from the interpretations of social actors. Two different ontological approaches exist and these are Objectivism and Subjectivism (also called Constructionism).

An objectivist philosophy is when one believes that our reality really subsists independently of us who live within it. In such a world, social phenomena exist separately from the social actors that build up the world. Social actors are powerless against these phenomena as they are not within the scope of what social actors can affect. (Bryman & Bell, 2011, p. 21)

Meanwhile a subjectivist view is when one believes that reality is subjective and is thus created by social actors who experience it. In this world social phenomena are consistently being created by social actors and these phenomena are continuously being affected and changing. As such only a subjective particular version of the world can be portrayed through research and not an absolute one. (Bryman & Bell, 2011, p. 21-22)

Our study questions the rationality of individual investors which could call for some inputs of subjectivism however the research we actually carry out will be dominantly objectivistic. As we intend to gather numerical data and analyze it statistically, through this process objectivism is the philosophy which will give the most accurate and valid results. Our research will focus on testing hypotheses through a scientific manner by studying the social world independently from the social actors which inhabit it. A subjectivist philosophy would become appropriate only once the data has been gathered and statistically analyzed. Subjectivism will then be useful to discuss and conclude regarding the results which have been produced and connect the results with the psychological theories which explain investor behavior. This is when subjectivism will allow us to observe how investors construct and affect social phenomena.

2.5.2. Epistemology

“The central problem of epistemology is to decide how we can acquire knowledge which Plato and others following him have defined as justified true belief.” (Ryan, 2002, p.11). There are two epistemological positions: Positivism and Interpretivism.

“Positivism – the view that all true knowledge is scientific, and can be pursued by scientific methods” (O’Leary, 2004, p.10). A positivistic view of the world is that the world is knowable, predictable and can be seen as one single truth. Where the researcher isn’t caught up in the research, instead he is a removed expert. The focus on being objective is also an important part of the researcher’s role. Positivism usually views the methodology as deductive with hypothesis testing to test the theory. This helps the researcher to achieve the goals of high reliability and replicability. To use the
methodological view the findings should be quantitative and generalizable with a focus on finding statistical significance. (O’Leary, 2004, p.7)

“Interpretivism – acknowledges and explores the cultural and historical interpretations of the social world” (O’Leary, 2004, p.10). In the interpretivistic position social actors rationalize social phenomena and occurrences through their own different perspectives. Thus each individual’s rationalization leads to their own interpretation and these interpretations are continuously recreated and updated. This view recognizes fundamental difference in the actors of the social sciences compared to the view in natural science. The researcher strives to understand the social actors different interpretations and the social world from their view point. Interpretivism often goes well with inductive theory building and with qualitative data collection strategies. (Bryman & Bell, 2011, p. 16-17, 27)

As with our ontological standpoint, our study does not exclusively follow one or the other of the epistemological views. However as the research we carry out ourselves is strictly scientific using numerical data this study will be done through a subjectivist philosophical position. In relation to the world we are objective gatherers and analysts. In relation to the data we are objective gatherers and analysts. In relation to the world we see our empirical research as being knowable and if done well enough there exists the possibility of producing an absolute single truth. However as the essential purpose of our research is to analyze rationality in individuals, the discussion and conclusion from our empirical research will also follow an interpretivistic view. We will strive to analyze and comprehend individuals and their interpretations on an in-depth level to assess their rationality. Through the application of concepts within behavioral finance we shall then view the world from the perspective of the individual.

2.6. Research Approach

The research approach describes the relationship between theory and research, mainly if the data collection is made to test existing theory or create new theoretical developments. Two approaches exist, Deduction and Induction.

The deductive research approach starts with its base in the existing literature and theory in an area. From this knowledge, the research deduces hypotheses that will be tested. Data is then gathered and the findings are compiled. Next the hypotheses are accepted or rejected. The final step “involves a movement that is in the opposite direction from deduction – it involves induction, as the research infers the immolations of his or her findings for the theory that prompted the whole exercises” (Bryman & Bell, 2011, p.11).

The other approach is induction where the researcher begins by gathering data, followed by theory creation using literature. As such the researcher starts off without “conceptual frameworks and predetermined theories” (Saunders et al., 2003, pp. 44-46). With induction, the result of the study is new theory as the researcher makes applicable inductive implications from the observations made. (Bryman & Bell, 2011, p.13)

To apply an inductive approach is common with a qualitative research method, when one strives to create new theory. An inductive approach does not cohere with our study as we start with a conceptual framework and strive to test theory. As it is usual for a quantitative study, our research will follow the deductive approach. We have built the
theoretical foundation for our work on existing theory and knowledge. Through this literature we have reached several hypotheses which stand to be tested. The hypotheses will be confirmed or rejected which will lead to a revision of theory. In this way we will test the rationality of investors, thus testing and evaluating existing theory and not generating new theory. This is in line with our ambition which was to study and evaluate an already well known and researched area and see how well the theories hold up. (Bryman & Bell, 2011, p. 11, 27)

2.7. Type of Study

The three main types of study are Exploratory study, Explanatory study, and Descriptive study. The Exploratory type of study is deployed to clarify and expand your understanding of a problem, and to search for new insights and a high level of understanding. The Explanatory study type is used to establish and clarify causative relations between variables. The third type is the Descriptive study which is used by the researcher to portray and describe the case of for example an event, a situation or a business. (Saunders et al., 2003, p. 96-98)

Our research is based mainly on an exploratory type of study, where we want to achieve a deeper understanding of the rationality of individual investors using Placera’s recommendations. To reach this understanding we explore and test different hypotheses.

2.8. Research strategy

The research strategy describes the researchers’ way of collecting and analyzing data, the two different strategies are: Quantitative and Qualitative.

A quantitative research strategy accentuates large samples of data in numerical form. It is accompanied by deduction as it works through existing theory, deducing hypotheses, testing hypotheses and revising theory. The nature of a quantitative strategy is natural scientific and objective. Observations and findings are collected without own interpretation and distortion by the researchers. The strategy is also positivistic and view social reality as external. (Bryman & Bell, 2011, p.26-27)

The second type of research strategy is the qualitative one. This strategy has a greater focus on words and in-depth interviews than on large numerical data samples. It goes hand in hand with induction where new theory is created. Within this strategy interpretivism and subjectivism are held to be true. As such the social reality is created and ever changing by individuals’ own perspectives and their interpretations. (Bryman & Bell, 2011, p.27)

We will not follow a subjectivist and interpretivist view in terms of our data collection and analysis. Instead this will be pursued through a natural scientific approach and carried out in an objective manner. In this way the empirical part of our study will have a valid scientific approach to it. To achieve the best research possible our study will follow a quantitative strategy. We have access to a solid database from which we will acquire a substantial numerical data sample. This large sample will give our study greater statistical validity. Furthermore, we aim to test and revise existing theory and such a deductive approach goes along well with a quantitative method. A quantitative
method is also the best way to manage and test a numerical database such as this one. It lets us complete the compilation of Placera’s returns and categorize these returns in the most efficient manner. This quantitative compilation allows us to evaluate their performance objectively and accurately.

2.9. Research Design

Research can be designed in several different ways, this is detrimental to how the research is shaped and carried out. Some of these designs are: Case study, Cross-sectional study, Longitudinal study and Experimental study.

A case study is a “detailed and intensive analysis” of a single case. Example of cases could be a single organization, location, person etc. A case study is often seen as a qualitative study but this isn’t always the case as “in some instances when the research is exclusively quantitative research, it can be difficult to determine whether it is better described as a case study or as a cross sectional research design” (Bryman & Bell, 2011, p. 60). There are many different types of case studies. For example a case study can be a unique case where the case is extreme and non-generalizable which is common in experimental and clinical research. Another type is the critical case which is when researchers use a well-defined hypothesis to reach a better understanding of how the hypothesis holds up. (Bryman & Bell, 2011, p. 59-62)

A cross-sectional research design seeks variations. This can be variations in terms of organizations, people, states etc. To find these variations a researcher will gather data taking a distinct period in time and using multiple cases establishing a quantitative sample. This data will then be analyzed, seeking to identify patterns, trends and variations. (Bryman & Bell, 2011, p. 53-54)

The longitudinal study is often applied as a research design to evaluate changes in business management. It is similar to cross-sectional in terms of cases and variables but instead of at one point in time, the longitudinal study will use data from a minimum of two points in time. This allows the researcher to see changes and analyze these. (Bryman & Bell, 2011, p. 57-59)

A rare design within business research is the experimental design. The experimental design seeks to find whether an independent variable does have an impact on a dependent variable. The common approach is as follows: “the experimental group, or treatment group, receives the treatment, and it is compared against the control group, which does not.” (Bryman & Bell, 2011, p. 45) Prior and post experiment the dependent variable is measured. Researchers can then analyze the potential change that has occurred in the dependent variable. (Bryman & Bell, 2011, p. 45-46)

Since we look at a single time period, the multi-period longitudinal design does not apply to our research. Neither are we conducting any type of experiment which excludes the experimental research design. Our study falls inconveniently well within the discrepancy Bryman and Bell explained where a quantitative research can be difficult to determine as a case study or a cross-sectional study. Our research design is cross-sectional as it uses a single time period, a large data sample and statistical analysis to evaluate results and find trends, correlation and variations. However since we will be
viewing the case of Placera, it is clearly a case study of an organization. More specifically it is a critical case study as we will specify and define several hypotheses and test these to see where they stand strong and where they fall apart. As such our study is cross-sectional but on a single case making it a combination of both.

2.10. Time Horizon

Our research will be subject to a time horizon of slightly over two years, from 2011 to 2012. We were concerned with several issues in how to choose our time horizon. Firstly when choosing a time period we wanted to ensure that the data sample of recommendations would be large to allow for high statistical validity. Further we wanted a period which would still be manageable to collect and handle within the time constraints we are subject to. We also wanted to have a very recent time horizon to ensure a contribution of recent data. Furthermore, it felt important to select a period sufficiently far after the recent financial crisis to avoid the immense impact and distortion which this event would incur. The investment horizon which Placera’s analysts use is over six months, which is why we need to allow for 6 months after the last collected recommendation so that this last one also has time to finish.

2.11. Data Sources and Literature

The two main types of data are primary data which is newly collected data and secondary data which is data that has been collected by somebody else and probably intended for a different purpose (Saunders et al., 2003, pp. 188). Our data sources are all of the secondary type, but we have ensured in all instances that we use the most official, updated and accurate data available.

For gathering our recommendations we have used Placera’s database which is an archive of all of their past recommendations. This is known as archival research which consists of documentary secondary data (Saunders et al., 2003, pp. 190). To acquire past index prices for the OMXGSI we have used the official Nasdaq OMX Nordic database on their website. For historical stock prices on stocks we have used BörsData which is a financial website which includes historical stock price development of every listed Swedish stock. For key numbers such as Betas and Volatility we have used Avanza Bank’s website. Other supplementary data such as dividends has been acquired from the specific company’s website and annual report.

Using secondary data can be very advantageous as it is an excellent time saver which allows the research to put this time to better use. It also can allow the research to access and acquire data that he or she perhaps could not have gathered as a primary source. Furthermore, secondary data can often be cheap and publicly available and easily accessible through the internet.

The use of secondary data faces several limitations and disadvantages. First, since that the data has not been collected by you yourself it may not be consistent with our own needs. In our case however, we have combined many different databases and data sources that fully fulfill our needs. Access to the data may be another problem, for instances it may be inconvenient or expensive to acquired. For our study this has not been a problem, all of the websites and databases are publicly available and readily...
accessible. Another issue with secondary data is the researcher has no real control of the quality of the data. To avoid this problem we have made much effort to ensure that our data sources are of the highest quality available. This is by using prime sources, originating articles, quality publications, high quality data bases, official sources etc. (Saunders, 2003, p.201-203)

Since our main target group is Swedish individual investors, we have used many Swedish sources to be able to find the most accurate and useful information. With a few of the sources not being translatable to English, this may cause a slight language bias. We see this as a minor problem since most sources are accessible in English and our study is restricted to the Swedish market. We do not see that this will have any negative effects on our results or the ability for others to replicate this research.

In terms of literature we have used books and articles. For all major concepts such as the efficient market hypothesis or overconfidence we have used the prime original article relevant. This is to ensure that it is the original wording which is studied and cited, avoiding distortion. This has when necessary been complemented with more recent research to ensure that any relevant updates or adjustments have been included. All the articles and research papers used have been published in journals which ensures that they are peer reviewed and of high quality. Also to show public or professional opinion and contemporaneity on certain matters, newspaper articles have been used.

Several books have also been used to complement the research articles when studying major concepts. To explain and describe minor or general concepts we have also used field specific textbooks. This has been necessary in some situations to thoroughly explain concepts on an appropriate level given the perspective of the study. Concerning statistics we have only used textbooks as there is no need for academic articles for our types of tests. When searching for these literature sources our primary modes have been Umeå University’s Library, Business Source Premier and Google Scholar. Examples of main keywords have been Behavioral Finance, Efficient Market Hypothesis, Random Walk, Rationality, Overconfidence, Anchoring and Herd Behavior.

The use of Investopedia as a source is an exception from the others. This is unfortunately not a prime, peer reviewed source. However it is only used to provide a definition for the aspect of an individual investor versus an institutional investor. Such a definition could not be found in quality literature sources as it seems to be assumed to be generally implicitly known. As such we could have gone the same way with it yet due to our perspective we chose to provide our reader with a definition.

2.12. Quality

The most commonly used criteria’s when evaluating quality of a quantitative study is reliability and validity. Meanwhile when evaluating the quality of qualitative research, the criteria are credibility, transferability, dependability, and confirmability. Since our research strategy is quantitative we will use reliability and validity when assessing the quality of our research. Reliability evaluates if the results of the study is repeatable. Validity is focused on the integrity of the results created from the study. A research with high level of both reliability and validity would yield consistent results which clearly fit with the research question. There are multiple forms of reliability and validity, we will
evaluate and discuss how our research holds up in terms of these criteria. (Bryman & Bell, 2011, p. 41-43)

2.12.1. Reliability

The first concept of reliability is stability, which assesses how stable the results of the study are. For example when repeating a measure on the same sample but in another point in time, the results of these measures should have a high correlation with each other. (Bryman & Bell, 2011, p. 157-158)

In terms of stability our research holds up well, since we use past prices of stocks and indices along with published recommendations. This figures, values and publications will remain absolute and thus will not vary over time or if studied by someone else. So if the study would be replicated in the future with the same sample and time horizon, it would yield the same results as ours did. The main part of our data is taken from Nasdaq's OMX, Avanza website and Placera.nu. As mentioned, all of our data has been acquired from sources that are freely and easily accessible for anyone who would wish to replicate our research.

The second factor involving reliability is internal reliability, which evaluate to which extent a measure is consistent within itself (Bryman & Bell, 2011, p. 157-158). The return we measure creates a consistency and stability within itself. This is supported by a large sample and simple calculations of which we have a deep understanding. The accuracy and relative simplicity of our measurements will strengthen the internal reliability of our research.

Concerning the reliability of the structure of our research methodology, we have used many different yet highly reliable sources and primarily the research book Business Research Method of Bryman & Bell (2011), complemented by research articles and the book Research Methods for Business Students by Saunders, Lewis and Thornhill. The methodology structure is easy to follow and replicate by other researchers.

Reliability of theory is another concern within research quality. We have made sure that each literature source is of prime quality to uphold the highest possible reliability in the literature we have used. For example by, whenever possible, using the original articles which created theories and coined concepts. The articles all stemmed from quality journals and publications, and many were found through Umeå University Library. Several well respected research books were also summoned through the library to complement the articles. Furthermore, textbooks used by the Umeå University in their courses and one used by York University in their courses were also utilized.

2.12.2. Validity

Measurement validity is concerned with “whether or not a measure that is devised of a concept really does reflect the concept that it is supposed to be denoting” (Bryman & Bell, 2011, p. 42). We face some challenges when it comes to measuring the concept we want to measure, the first and largest one is to risk adjust the stock returns to be able to compare them to an index and to each other. Since the risk level in all investments has to be equal before we can make comparisons. There are many ways to measure and
adjust for risk and no official perfect measurement exists. We have chosen to use beta ($\beta$) to adjust the returns for risk, which is an academically accepted risk measure. Secondly our choice of time period, for analyzing anchoring on trends, is 3 months, it is not for certain that this will give and accurate picture of the trend. In some cases there may have been a large boom or crash just prior to our time period, this would affect the trend in the minds of investors and analysts, but would not be reflected in our measure. However due to the randomness of this type of occurrence, this problem will cancel itself out due to our large sample.

*Internal validity* is “concerned with the question of whether a conclusion that incorporates a causal relationship between two or more variables holds water” (Bryman & Bell, 2011, p. 42). In our case this could for example be whether a higher closing then three months before the recommendation really represents a positive trend? This is one of our causality problems, and there are many ways to determine a trend in a stock. We have chosen this way of determining a trend because it is a simple and effective method, which is as good of a representation of reality as any other.

*External validity* is a criterion of evaluating whether or not the findings can be generalized outside the particular context of the research (Bryman & Bell, 2011, p. 43). The fact that we use only one broker for the recommendations is something that one could argue, will affect our ability to generalize the results beyond the case of Placera. However Placera is an immensely large financial website which reaches across all of Sweden. As such there is no systematical selection or targeting of individual investors which allows us to reach a random sample of individual investors through Placera alone. Also the fact that our research is made on Swedish recommendations of Swedish companies can have an effect on the external validity, by that one argues that rationality and efficiency can vary over countries due to other markets being larger with more participants, and more institutional investors. Yet this is how we contribute, through narrow and specific research which restricts the global generalization possible. The choice of time span for our sample can also affect the ability to generalize the results. However we use a sample over two relatively volatile and consolidating years, which are not greatly distorted by major events such as the financial crisis.

Ecological validity concerns if the results can be generalizable and applied in natural social settings and societies everyday life (Bryman & Bell, 2011, p. 43). This is one of our research strongest qualities, since our contribution focuses on this being of help to investors in their everyday life of investing. We also contribute to Placera and assist their organization. We have put a lot of work in creating a high practical value of our research to be able to reach the goals of our contributions. The results are also applicable in its natural setting, since the stock returns from the recommendations are taken from the natural setting, instead of creating some kind of simulation or experiment to test the returns and other criteria of the recommendations. But one should always have in mind that there is no guarantee that historical events will reflect the future.

### 2.13. Ethical Issues

The researcher’s ethical responsibility is to insure that the research holds good quality, is morally acceptable. It is advisable to make it a daily routine of reflecting over this.
The researcher should also behave professionally and follow local and national rules, norms and guidelines at the workplace. It can be unprofessional and unethical to accept gifts from industries or participants. Research misconduct is a topic that has received increased attention concerning fabrication, falsification and plagiarism of data and outcomes from the study. (CODEX, 2013a)

Both researchers have taken an ethics test in the start of the master program where we produce good results. This test required that the student displayed a high level of ethical understanding, knowledge of correct referencing and the ability to distinguish the most ethical solution to a problem. Together with many years in school where ethical concerns have always had a supreme standing and classes have been dedicated to correct referencing, literature searching and such. This has helped us to perform our research in a professional way, respecting local and national rules and norms as well as working place guidelines.

In our research we collaborate with Placera through Avanza Bank. We use their recommendations as our data base and we will contribute to them an accurate and detailed performance compilation. Besides from practical relevance and real world connection, we do not receive any compensation what so ever from our partner. As such we have no incentives to provide manipulated or biased data and results. Instead we firmly believe that we will acclaim the most personal gain through providing research with high accuracy and integrity. Together with Placera we have a written agreement where both parties allow for publication of the paper and the results regardless of the outcome of the study.

As we are two students conducting this research we have a shared responsibility for what we write. The fact that we are two increases our ability to ensure a high quality during the research as we can assist each other. Since our data is strictly numerical we also have a reduced risk of subconsciously manipulating or misinterpreting the data.

Along with the guidelines for proper research conduct we used prime sources and our referencing and citing follows the recommendations of Umeå University. This is to avoid plagiarism, cheating and to pay credit where credit is due. Our data has been acquired in a perfectly ethical fashion, it has not been stolen or utilized without proper permission. Placera’s database of recommendations is easily accessible and publicly available to all. Other sources include for example Avanza Bank’s webpage, which is publicly available to everyone and the Nasdaq OMX website, also publicly available.

2.14. Societal Issues

Our results will be very useful for individual investors when evaluating the value of Placera’s stock recommendations. A major goal of our work is to enlighten individual investors regarding the actual performance of investors and the profitability of mimicking them. Through the knowledge contributed by us here, the information given in the recommendations will be easier for society to interpret in a fair and true way. Some people may for example believe that the real purpose of analysts’ recommendations is only to increase the quantity of transactions so that the broker makes more money. We will then help society to clarify such issues and reduce the risk of deception since investors can view the real performance of the analysts.
The Swedish government has established that research shall “…support a sustainable development that creates a good, healthy environment for this and future generations, economical and social welfare and justice” (CODEX, 2013b). Through conducting our research in an ethical and professional manner we strengthen the research culture. We also strive to show other researchers that accurate and objective results are the most valuable. This may assist and reinforce ethical and societal concerns within our society.

The debate surrounding the value of investment recommendations is a sensitive subject with widely spread opinions. The subject is in need of more objective research to enlighten the individual investors and the society. As we conduct our research independently from Placera and Avanza, this is an aspect where our research can contribute to society.

By evaluating Placera’s recommendations, performance and its value creation, we can create a higher sense of morality by clarifying reality. We will expose Placera’s performance over this time horizon entirely. This could increase morality in Placera as well as other analyst firms and thereby be a contribution to society.
Chapter 3: Theoretical Framework

This chapter describes the theory and past research which envelop our subject. The initial part is mainly descriptive as it provides descriptions of necessities such as the Swedish stock market, individual investors and stock recommendations. It follows by outlining previous research on stock recommendations. The part which follows this is more theoretical and conceptual. It is structured chronologically describing the theories of the Random Walk and the Efficient Market Hypothesis. This is followed by efficient market anomalies and countering evidence. The concept of rationality is then discussed along with irrationality. Behavioral finance and related concepts of overconfidence, anchoring and herding are then covered. Then the chapter concludes with the formulation of five sub-research questions based on the presented theories and existing research.

3.1. Swedish Stock Market

The Swedish Stock Market is divided into a Large Cap (Large Capitalization), Mid Cap and Small Cap category. Further smaller categories included Aktie Torget, First North, NGM Equity, NGM Nordic, MTF and more (For our study, in the Small Cap segment we have incorporated the Small Cap and the other smaller listings into one) (NasdaqOMXNordic, 2013). The whole market summed to SEK 4039 billion towards the end of 2012. It has grown from SEK 2212 billion by 82.6% over the last 10 years (Statistiska Central Byrå, 2013). The volume on the Swedish stock market has increased immensely from around SEK 100 billion per year in 1990 to almost SEK 4000 billion yearly in 2006 (Lidén & Rossander, 2006, p.17-18). The ownership structure is very international as foreign owners hold 40.3% of the market, where the US and the UK are the major owners (Statistiska Central Byrå, 2013).

3.2. Individual vs. Institutional Investors

There are several distinct differences between an Individual investor and an Institutional investor. Institutional investors invest and trade with funds that they have not accumulated themselves. They invest upon the behalf of others in forms of pensions, mutual funds, insurance and more. Investment banks, hedge funds and money managers are also all included within this categorization. Institutional investors trade with gigantic sums of money and hold great power over the stock market. Individual investors on the other hand invest and trade with their own money through banks or brokers. These are normal people saving for perhaps retirement or large future purchases. Individual and institutional investors also differ in terms of legal issues, first of all since individual investors are people while institutional investors are firms. As institutional investors are knowledgeable professionals, the government has a heavier focus on protecting the individual investors. (Renaud, 2009)

De Bondt talks about four main skill differences between individual and institutional investors. First one is perceptions of price movements which concerns the use of for example technical analysis. Perception of value is the second one which describes that many individual investors lack the knowledge to understand and perform valuation models, for example the dividend discount model. Consequently these investors are less
educated and have a lower financial understanding. Managing risk and return is the third skill difference which describes that individual investors are undiversified. The fourth and final one De Bondt mentions is Trading practices which explain individual investors’ psychological disadvantage and the lack of using tools to control emotions, as for example the stop loss order technic. (De Bondt, 1998, p 833-837)

In Sweden the households hold 10.8% of the total market, which is SEK 436 billion and the mean portfolio sums to SEK 278 000. Household ownership has diminished, in 2005 these investors held 15.3% of the market. The amount of Swedish people who hold shares has diminished continuously over the last 10 years. In 2002m 22.6% of the population held stocks while now in the end of 2012 only 14.9%, 1 419 078 people, hold stocks. (Statistiska Central Byrå, 2013)

3.3. Analysts

An Analyst is a financial expert who evaluates and compares the value of investments, to produce buy, sell and hold recommendations for different securities. They are often focused in analyzing and monitoring specific sectors or industries (Investopedia, 2013). In other words an analyst provides recommendations and information to help individual investors to allocate their money. In Placera’s case the analysts evaluate and recommend investments in stocks. Analysts try to beat the market through active management where they pick individual stocks.

3.4. Placera

Placera is a web page owned by a subsidiary of Avanza Bank. Avanza is the broker that produces most stock transactions in Sweden, and has over 466 000 customer accounts (Avanza, 2013a). Placera is the third largest business website in Sweden with over 210 000 unique visitors every week. Placera is independent from Avanza and is thereby financing itself though advertisement. (Avanza 2013b)

Placera’s main business is advising and guidance through stock and fund recommendations, but also to analyze the daily events in the economy. Their goal is to supply daily information to their readers to help them make valuable investment decisions. Börsveckan is also part of the subsidiary Placera Media AB they share officespace and some of their analysts. Placera’s recommendations are based on fundamental analysis, and they usually don’t take herding or technical analysis into consideration. They also require higher possible gains to recommend investments with high risk. Their investment horizon is 6 months. Placera have five analysts working for them, two of which also work for Börsveckan. (Avanza, 2012)

3.5. Stock recommendations

A stock recommendation is defined as a piece of concrete investment advice given to a reader regarding the purchase or sale of a specific stock (Lidén & Rossander, 2006, p.58). Traditionally in Sweden it was very beneficial to hold stocks on long investment horizons as the tax on the profit when selling the stock decreased the longer the stock was held. However this privilege was abolished in 1990 and the tax advantage of long
term investments vanished. This resulted in shorter investment horizons, increasing speculation and increases in trading. Also the internet contributed to this as it brought speed and ease to stock trading and the spread of information. Along with this the amount of stock recommendations increased, not only from banks and brokers, now publication by less serious journalist also began to increase. (Lidén & Rossander, 2006, p.58)

Both the existence of stock recommendations and how this business continues to grow indicate that investors actually follow this type of advice. Furthermore studies done in the US have shown that the trading volume in stocks which were recommended in the wall street journal experienced an abnormal trading volume for a minimum of six days after the recommendations were published (Barber & Leoffler, 1993, p.277). This shows that recommendations draw attention to specific stocks and the people follow this advice since the recommendations create an abnormal volume in the stock.

3.5.1. Previous Studies of Swedish Recommendations

The by far largest study and compilation of Swedish stocks was done by Erik Lidén and Markus Rosenberg between 1995-2004. This research covered 6041 Swedish stock recommendations and is by far the largest sample ever done in Sweden. The second largest included only 1600 recommendations. The 6041 recommendations were distributed as 5190 buy recommendations, 851 sell recommendations and came from 11 different magazines. (Lidén & Rossander, 2006, p.11, 68)

The results of this study can be seen in Table 1 to 5. The recommendations have been compared to a portfolio of stocks of equal risk as the recommended stock. (Lidén & Rossander, 2006, p.). When compiling the results categories have been made consisting of Analysts, Journalists and a total of All. The time horizon has been split into consisting of three, six, nine and twelve months. Numbers noted in bold have been held to of statistical significance.

<table>
<thead>
<tr>
<th>Buy recommendations</th>
<th>Recommendations</th>
<th>Time horizon</th>
<th>Return(%)</th>
<th>Return(%)</th>
<th>Return(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All (5190)</td>
<td>3 month</td>
<td>0.78</td>
<td>1.23</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>Analysts (1582)</td>
<td>6 month</td>
<td>0.37</td>
<td>0.46</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>Journalists (3608)</td>
<td>9 month</td>
<td>-1.54</td>
<td>-1.27</td>
<td>-1.66</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 month</td>
<td>-1.85</td>
<td>-2.88</td>
<td>-1.4</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Returns from buy recommendations, a prior study
Source: (Lidén & Rossander, 2006, p.88)

Here in Table 1 it is evident especially for the Analysts category and All category that the recommendations perform slightly better than the benchmark portfolio in the short term and then the recommendations are outperformed. Also notable is that the perhaps less serious and less professional journalists actually outperform the analysts significantly over the longer term, especially since the sample is so large.
### Small cap buy

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>All (38%)</th>
<th>Analysts</th>
<th>Journalists</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time horizon</strong></td>
<td>Return(%)</td>
<td>Return(%)</td>
<td>Return(%)</td>
</tr>
<tr>
<td>3 month</td>
<td>3,17</td>
<td>4,84</td>
<td>2,54</td>
</tr>
<tr>
<td>6 month</td>
<td>3,55</td>
<td>5,13</td>
<td>2,95</td>
</tr>
<tr>
<td>9 month</td>
<td>4,52</td>
<td>6,08</td>
<td>3,95</td>
</tr>
<tr>
<td>12 month</td>
<td>5,79</td>
<td>9,01</td>
<td>4,61</td>
</tr>
</tbody>
</table>

**Table 2.** Returns from buy recommendations of Small Cap companies, a prior study

**Source:** (Lidén & Rossander, 2006, p.90)

The Small Cap buy recommendations however produced significantly different results than the summed of all Caps. Across the board we find that the recommendations outperform the index and that the performance improves over time. The analysts prove themselves within the small cap category and significantly outperform the journalists. The overall result is significantly positive.

### Mid Cap buy

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>All (31%)</th>
<th>Analysts</th>
<th>Journalists</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time horizon</strong></td>
<td>Return(%)</td>
<td>Return(%)</td>
<td>Return(%)</td>
</tr>
<tr>
<td>3 month</td>
<td>0,32</td>
<td>-0,13</td>
<td>0,49</td>
</tr>
<tr>
<td>6 month</td>
<td>-0,96</td>
<td>-3,33</td>
<td>-0,09</td>
</tr>
<tr>
<td>9 month</td>
<td>-2,62</td>
<td>-6,59</td>
<td>-1,14</td>
</tr>
<tr>
<td>12 month</td>
<td>-3,28</td>
<td>-9,19</td>
<td>-1,09</td>
</tr>
</tbody>
</table>

**Table 3.** Returns from buy recommendations of Mid Cap companies, a prior study

**Source:** (Lidén & Rossander, 2006, p.90)

In the Mid Cap section, things take a turn for the worse, especially for the analysts which produce a negative return for all Cap sizes and get steadily worse as the time horizon increases. The journalists’ recommendations perform better and sum up to approximately break-even on all time periods.

### Large Cap buy

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>All (31%)</th>
<th>Analysts</th>
<th>Journalists</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time horizon</strong></td>
<td>Return(%)</td>
<td>Return(%)</td>
<td>Return(%)</td>
</tr>
<tr>
<td>3 month</td>
<td>-0,81</td>
<td>-0,21</td>
<td>-1,14</td>
</tr>
<tr>
<td>6 month</td>
<td>-1,15</td>
<td>-0,12</td>
<td>-1,73</td>
</tr>
<tr>
<td>9 month</td>
<td>-5,62</td>
<td>-2,5</td>
<td>-7,34</td>
</tr>
<tr>
<td>12 month</td>
<td>-6,83</td>
<td>-6,18</td>
<td>-7,18</td>
</tr>
</tbody>
</table>

**Table 4.** Returns from buy recommendations of Large Cap companies, a prior study

**Source:** (Lidén & Rossander, 2006, p.90)

For the Large Cap stocks the analysts remain outperformed especially in the longer time horizons. The journalists also fall behind significantly to the benchmark both on the 9 and 12 month periods. The overall results for the Large Cap category are by far the worst for the buy recommendations. With -6,83% the recommendations perform twice
as bad as the Mid Cap category. Meanwhile the Small Cap category significantly outperform the other categories overall with a positive return of 5,79%.

<table>
<thead>
<tr>
<th>Sell recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommendations</strong></td>
</tr>
<tr>
<td><strong>Time horizon</strong></td>
</tr>
<tr>
<td>3 month</td>
</tr>
<tr>
<td>6 month</td>
</tr>
<tr>
<td>9 month</td>
</tr>
<tr>
<td>12 month</td>
</tr>
</tbody>
</table>

Table 5. Returns from sell recommendations, a prior study  
**Source:** (Lidén & Rossander, 2006, p.91)

For the sell recommendations, no size distribution is made due to the smaller quantity of recommendations. Over the very few sell recommendations published by analysts the performance is astounding and more than doubles the performance of the journalists. The overall is only slightly higher than the mean of the journalists due to the difference in the quantity of recommendations between journalists and analysts. Compared to the overall of the buy recommendations, the sell recommendations prove immensely more profitable.

<table>
<thead>
<tr>
<th>Total recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommendations</strong></td>
</tr>
<tr>
<td><strong>Time horizon</strong></td>
</tr>
<tr>
<td>3 month</td>
</tr>
<tr>
<td>6 month</td>
</tr>
<tr>
<td>9 month</td>
</tr>
<tr>
<td>12 month</td>
</tr>
</tbody>
</table>

Table 6. Return from all recommendations, a prior study  
**Source:** Made by Authors

In this last table, the overall total is presented. When summing the returns from both the sell and buy recommendations we see the overall performance of the recommendations. Besides from the 12 month time span, the recommendations saw a slight abnormal return over the benchmark portfolio.

For our research these figures are of high relevance, first of all as we make the same categorization to a large extent. Second because Börsveckan’s recommendations are included in the sample which is a part of Placera and they share analysts. It is also noteworthy that when the performance of the eleven different firms is compared, the winner by far is Börsveckan. Over the whole time horizon Börsveckan’s buy recommendations on the 12 month time horizon totaled at 5,77% return while the runner-up, Privata Affärer, totaled at only 1,39% in return (Lidén & Rossander, 2006, p.92).
3.5.2. Small is Better

Prior research shows a relationship between stock return and size of the company. This relationship is researched by Rolf Banz which has studied common stocks on the NYSE between the years 1936-1975. The result of the study was that smaller companies on average showed higher risk adjusted returns than medium and large size companies. The results shows that the returns are not linear in market value, the small size companies shows a clear excess risk adjusted return meanwhile there is little difference on the returns between mid and large size companies. This is just another puzzle in the efficient market hypothesis and displays the possibility to beat the market without taking extra risk. (Banz, 1981, p. 3-4)

Also another newer study by Bauman et al. shows that non US small size companies generate a significant higher return then the large size companies on a sample of 10 years (Bauman et al., 1998, p 85). This abnormal performance by Small Cap firms was also seen in the Swedish study presented in the figures above. Hence, this phenomenon has been seen to be significant and consistently reoccurring.

3.5.3. Better off Selling

Research has also shown that there are differences in value between buy and sell recommendations. A study made on recommendations in 8 developed countries between January 1994 and December 2006, shows that analysts tend to issue buy recommendation more frequently then sell recommendations. This can be interpreted in the way that there is an excess optimism among analysts. The optimism bias can have an effect on the quality of the recommendations and thereby indicates that investors should use this information carefully. This research also demonstrates that buy recommendations do not deliver a significant positive risk adjusted return, meanwhile sell recommendations provide a higher value for investors. The same results and conclusion were found in the Swedish compilation above, as such, this proves to be another reoccurring and significant phenomenon. (Balboa et al., 2008, p 424-425)

3.6. Portfolio Theory

When publishing recommendations, analysts do not consider portfolio building. Consequently this is something that mimicking investors give up if they do not consider their purchased and short-sold stocks as a portfolio. Portfolio theory breaks down to how investors attempt to increase their expected return and at the same time reduce the standard deviation of the returns of the portfolio. A portfolio with the lowest possible standard deviation for a specified expected return, or the highest expected return at a specific standard deviation, is an efficient portfolio. Investors should choose the efficient portfolio which is best suited to their desired risk level to achieve the best possible risk reward situation. (Brealey et al., 2011, p.203-204)

The alternative, passive portfolio management is buying an index, this maximizes diversification (it removes all firm specific risk) and has low costs. For example individual investors can buy mutual funds which track a stock market index, this is known as indexfunds. (Brealey et al., 2011, p.320-321)
Beta (β) is a common tool when measuring the risk of an individual security in relation to the stock market. Beta measures the relationship between price movements in the market and individual security. A stock with a beta of 1 means that the stock on average moves in lock step with the market, 1 is thus the beta of the market index. The numerical value of the beta indicates how sensitive the stock is to movements in the market index. A high beta value means that the stock is very sensitive to movements in the market. While a lower beta means that the stock is less sensitive to price changes in the market index. (Brealey et al., 2011, p.174)

The Beta (β) as a tool for adjustments of returns is used within the Market model which is the Expected stock return = α + β x return on market index. Where Alpha (α) stands for the average movements of a stock when the market index is unchanged. Thereby the Market model is a theory for a relationship between the return of a security and the return of a market portfolio and provides a ground for the reasoning regarding the beta. (Brealey et al., 2011, p.318 & 931)

3.7. The Random Walk Theory

In 1953, Maurice Kendall studied the behavior of series of stock prices by examining serial correlation coefficients. He observed prices change randomly with short interims and found that the change between periods was too substantial for any systematic effect to exist, indeed “The data behave almost like wandering series” (Kendall, 1953, p.11). This finding would also mean that there is no possibility, without external information, to predict future stock price changes using past prices. Thus prices are independent from each other and cannot be used for predictive purposes. (Kendall, 1953, p.11)

Generally two types of tests of the theory have been conducted and in an extremely numerous amount. The first uses serial correlation coefficients and other statistical methods to test independence. The second test would be to compare the results of a buy-and-hold strategy and a mechanical strategy based on strict rules (Fama, 1995, p.77). In terms of the first test, in 1995 Eugene Fama summarized the major studies done they tended to produce results where the serial correlation coefficient was close to zero. Fama stated that “I know of no study in which standard statistical tools have produced evidence of important dependence in series of successive price changes.” (Fama, 1995, p.77).

Figure 2 illustrates the independence of daily changes in stock prices for four stocks during January 1990 to May 2009. It shows the return on the first day in relation to the return the next day. If the price for these stocks would have had significant dependence then some observable trend or pattern should be visible. However only random chaos can be seen and the correlation for each stock’s returns is close to zero. Due to this lack of correlation the observed return on the first day gives no indication of what return will be seen the next day.
3.8. The Efficient Market Hypothesis

The random walk theory laid the foundation for arguably one of the most comprehensive, famous and controversial economic theories ever – the theory of efficient markets. Fama developed this theory in 1970 and it is still hot today with much ongoing debate and research.

An efficient market was defined as “A market in which prices always "fully reflect" available information is called "efficient. "” (Fama, 1970, p.383). In such a market, the price of a stock would reflect all available information therefore the price would be equal to the intrinsic value of the stock. That would exclude the possibility for investors to make abnormal profits in the long run and consistently beat the market. This would only be possible if one had and exploited an informational advantage compared to other investors. Although in the short run it is inevitable to see investors make extreme profits due to the sheer amount of investors consistently attempting to triumph and some getting lucky.

Figure 2. Correlations, proof of Random walk
Source: (Brealey et al., 2011, p.316.)
Fama first categorized the hypothesis into three forms: the weak, semi-strong and strong form. The weak form implies that the information reflected in prices is only historical prices, thus no one can profit by analyzing historical prices and trends. The categories were expanded and modified in 1991 and the weak form now incorporates tests using interest rates and dividend yields to make forecasts for return predictability analyzing equilibrium prices (Fama, 1991, p.1576). With the semi-strong form, market prices include all obviously publicly available information such as annual reports, announcements and so on. Meaning that one cannot profit from analyzing public information like financial statements (Fama, 1970, p.388). Finally the strong form suggests that the market is entirely efficient and stock prices reflect all available information both public and private. Thus the only way to profit would be to have some source of monopolistic informational advantage (Fama, 1970, p.415). The semi strong form was modified to event studies analyzing how prices adjust when public announcements are made. The strong form tests were renamed to “tests for private information” seeking investors holding private information which is then not already reflected in the market prices (Fama, 1991, p.1577).

For a high degree of efficiency to be possible Fama presents three conditions however the hypothesis does not stand and fall absolutely based upon them. He describes a market where first of all, there is no transaction cost associated with trading stocks. Second, all of the information in the market is freely available to all market actors. Third, the participants on the market are in agreement concerning the inferences which this information has for the going stock price and the distribution of future stock prices. (Fama, 1970, p.387)

The definition of an efficient market was expanded in 1995 by Fama to include the characteristics of the market participants. These participants are of a numerous amount, they seek to maximize their profit and compete with each other. All of them are making forecasts and estimates of future stock prices and are privy to important information. Furthermore, and probably most importantly these market participants are rational. The competition between these rational return maximizing investors will create efficiency as current prices will include past and present information but also information that the market expects to come. (Fama, 1995, p.76)

Even the legendary investor Benjamin Graham before his death expressed his doubts to the profitability of stock picking. According to him this was profitable business when the stock market was relatively young, 80 years ago or so. Graham said: “I am no longer an advocate of elaborate techniques of security analysis in order to find superior value opportunities.“ he doubted that these would continue to lead to abnormal profits and instead voiced that: “I’m on the side of the "efficient market" school of thought now generally accepted by the professors.” (Graham, 1976, p.22).

### 3.8.1 Market Efficiency Anomalies

Yet there are many inconsistencies on the market in terms of market efficiency. These inconsistencies are called market anomalies. Anomalies are often small which creates difficulties in profiting from them, especially after transaction costs. Several types of anomalies will now be explained.
First out is *The Day of the Week Effect*: out of the five days in a week which the stock market is open one would presume that Monday would have the highest return. This is because the market is closed on Saturday and Sunday thus when calculating the return on Mondays one would essential incorporate all three of these days. Mondays should then triple the average return of any other day. Surprisingly Monday has by far the lowest return and is the sole day which has a negative return on average (see Table 7). Over a 54 year period Monday averages a negative return of -0.072% while Tuesday to Friday all range between positive returns of 0.032% and 0.089%. Exploiting this effect however may be difficult still it does not fit in well with the random walk theory or efficient market hypothesis. (Jordan et al, 2009, p.251-252)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950–2004</td>
<td>-0.072%</td>
<td>0.032%</td>
<td>0.089%</td>
<td>0.041%</td>
<td>0.080%</td>
</tr>
<tr>
<td>1950–1979</td>
<td>-0.137%</td>
<td>0.001%</td>
<td>0.094%</td>
<td>0.061%</td>
<td>0.115%</td>
</tr>
<tr>
<td>1980–2004</td>
<td>0.006%</td>
<td>0.069%</td>
<td>0.083%</td>
<td>0.018%</td>
<td>0.039%</td>
</tr>
</tbody>
</table>

**Table 7. The Day of the Week Effect**

**Source:** (Jordan et al, 2009, p.252)

The second effect is the *January effect*: over 30 years ago a difference in return, even when factoring in risk, between larger and small firms was identified. Consequently investors seemed to be earning excess returns in small stocks contrary to what the efficient market hypothesis would suggest. Additional features of the phenomenon were found and a large part of this return in small stocks came in early January and furthermore this effect was greater in the shares which had seen substantial prior depreciation. As Figure 3 displays, the average return for small stocks over this 79 year period is around 6.5% compared to the other months which are all below 2% and some even negative. This effect is partially explained by tax loss selling towards the end of the year and that institutional investors invest large sums in small stocks in the beginning of the year. Still however this effect is so significant that it allows for excess profits to be made and serves as a great thorn in the foundation of the efficient market hypothesis. (Jordan et al, 2009, p.252-254)
Thirdly we had the Turn-of-the-Month Effect: research has also identified that the return during the turn of the month may be higher than the other days of the month. In the table below the Turn-of-the-month days covers the last day of the month and the first three days of the following month and the other days are put in the Rest-of-the-days category. A significant abnormal return is seen in the turn-of-the-month days in all three of the periods in table 8. This provides profit opportunities and yet another puzzle for efficient market proponents. (Jordan et al, 2009, p.255)

![Figure 3. January effect for Small Cap](image)

Source: (Jordan et al, 2009, p.253)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Turn-of-the-Month Days (%)</th>
<th>Rest-of-the-Days (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962–2004</td>
<td>0.138%</td>
<td>0.024%</td>
</tr>
<tr>
<td>1962–1983</td>
<td>0.126%</td>
<td>0.020</td>
</tr>
<tr>
<td>1984–2004</td>
<td>0.151%</td>
<td>0.028</td>
</tr>
</tbody>
</table>

Table 8. Turn-of-the-Month Effect
Source: (Jordan et al, 2009, p.255)

A different anomaly is found in the P/E ratio as stocks’ with a relatively low Price/Earnings ratio have been found to outperform stocks’ with higher P/E ratios. However since P/E ratios are included in public information this is inconsistent with the efficient market hypothesis which would claim that all public information is persistently reflected in the stock price. Furthermore a strategy of buying relatively low P/E stocks and selling relatively high P/E stocks would have generated a profit which is also puzzling in terms of efficiency. (Jordan et al., 2009, p.256)

Bubbles and crashes are also inconsistent with the efficient market hypothesis. A bubble can be defined as “a bubble occurs when market prices soar far in excess of what normal and rational analysis would suggest”. While a crash is “…a significant and sudden drop in marketwide values” (Jordan et al., 2009, p.256-257). The inconsistency is that the efficient market hypothesis would claim that the price of a stock is equal to its value and that investors are rational. But continuous occurrence of bubbles and crashes
suggest that prices sometimes soar far above the intrinsic value of a stock due to irrationality and other flaws investors may have. Significant crashes have been seen in for example 1929, 1987, 2001, 2008 and for all we know they will just keep coming. The extreme amounts of irrationality associated with a bubble and the major discrepancy this causes between prices and values are major contradictions to the theory of efficient markets. (Jordan et al, 2009, p.257-261)

3.8.2. A Non-Random Walk

In 2002 Lo and MacKinlay began casting some serious doubt on the random walk hypothesis. They conclude that “We have rejected the random walk hypothesis for weekly stock market returns by using a simple volatility based specification test.” (Lo & MacKinlay, 2002, p.39). The empirical results of their tests show an inconsistency between the stochastic behavior or returns on a weekly basis and the random walk hypothesis. Additionally Lo and MacKinlay found that short-run serial correlation was not zero, in fact the serial correlation on a weekly and monthly basis were significantly positive (Lo and MacKinlay, 2002, p.18). These findings create distrust both in the random walk hypothesis and the efficient market hypothesis as it is fundamentally founded on the former. The non-randomness of prices changes also allow for the possibility of prediction. Lo and MacKcinlay state that “Our results show that predictable components are indeed present in the stock market, and that sophisticated forecasting models based on measures of economic conditions do have predictive power.” (Lo and MacKinlay, 2002, p.283). Alas maybe the markets are not so efficient after all.

3.9. Rationality

Restating the relevant definition of rationality, Vriend states: “Rationality in economics means that an individual agent chooses (one of) the most advantageous options, given his preferences, in his perceived opportunity set.” and he adds: “such that all perceived costs and benefits are taken into account; in particular, information, decision-making and transaction costs” (1995, p.268-269).

Rationality is a key assumption in many economic models. By assuming that investors are rational, the volatility, dynamics and unpredictability of human behavior is constricted. This makes human behavior more static and controllable allowing for economic models to explain relationships, behavior, market phenomena and such.

When investors assess the value of stocks and are rational they will find its theoretical value by calculating the net present value of all future cash flow and discounting them based on their risk adjusted required return. Then if new information arrives the rational investors will rapidly adjust to this news by buy or selling stocks depending on the nature of the news. This will lead to efficiency as stock prices will reflect all existing public information in the market and continuously adjust to new information. (Shleifer, 2000, p.2)

So if rationality creates efficiency, rational investors would do best with a passive strategy of buying and holding the index. Yet we observe investors doing things quite contrary to this logic some examples of this include: “Investors follow the advice of
financial gurus, fail to diversify, actively trade stocks and churn their portfolios, sell winning stocks and hold on to losing stocks thereby increasing their tax liabilities, buy and sell actively and expensively managed mutual funds, follow stock price patterns and other popular models.” (Shleifer, 2000, p.10). These common observed types of irrational behavior certainly raise questions towards assumptions of full rationality of all investors. Still there are many more anomalies within rationality to be discussed.

- Anomalies within Rationality

Many anomalies concerned with the rational behavior of investors have been identified. One of these is the endowment effect identified by Thaler which can be described as that people will value an asset they have higher than what they themselves would pay to acquire this asset (Kahneman et al., 1991, p.194). An example of this is a rather casual wine enthusiast who happens to purchase wine at a low prices of $10 per bottle, the price of this wine then appreciates, selling for 200$/bottle on auction. The enthusiast consumes some of this wine on occasionally but is neither willing to sell the wine on auction nor to purchase an additional bottle at the market price. This is the endowment effect, it leads to an individual having an inconsistency between their willingness to pay and their willingness to accept. The individual is not willing to pay the amount that he or she is willing to accept for the asset. This is associated with the individual’s aversion of losing what he or she once had. This type of behavior suggests that investors are not completely rational when valuing an asset they own. (Kahneman et al., 1991, p.197)

Another type of irrational behavior is seen in Prospect Theory. If investors were rational they would aggregate the net effect of gains and losses associated with an alternative and decide which is more preferable. However a study in 1979 showed that investors are not that rational in this way and developed the concept of prospect theory. This theory asserts that investors value gains and losses differently. Consequently when an investor is faced with two alternatives with equal expected results but one is conveyed as a possible loss and the other as a possible gain, the investors will select the latter. This implies lack or rationality through how that the negative emotions associated with a possible loss are greater than the positive emotions associated with a possible gain. Furthermore investors in their decision process have been seen to miscalculate probabilities when they weight different alternatives. More risky alternatives have been seen to be too heavily discounted. This behavior shows an irrational aversion towards risk (Kahneman & Tversky, 1979, p.263). Instead of objectively viewing their investment’s current value, investors focus on the current profit or loss they have made on their investment. Investors also factor in their profit or loss of their previous investment when making a new investment decision. In cases where the investors have previously made a loss they demand an even higher certainty on their next investment to further minimize the risk of another loss. Meanwhile an investor coming off a series of profitable investments is more likely to take on high risks know that they will still be in the green if they incur a reasonable loss (Brealey et al., 2011, p.326).

These two anomalies are both related to Loss Aversion which is that the “disutility of giving up an object is greater that the utility associated with acquiring it.” (Kahneman et al., 1991, p.194). This has been seen in many experiments where the subjects choose between two alternatives where one is framed as payment with the possibility of receiving something and the other as the possibility of gaining something but also the
risk losing with equal expected value as the payment. Thus there is a significant
aversion towards making losses while investors should be purely focusing on the
expected end result. This observable fear contributes to irrationality as scenarios with
superior expected returns will be too heavily discounted compared to scenarios with a
break-even certainty or similar. (Kahneman et al., 1991, p.197)

Investors have also shown irrationality in their Beliefs about Probabilities. Many
investors lack thorough education in statistics and probability theory which may lead to
systematic errors in their predictions and estimations. A general tendency identified is
that investors often make prediction using a very short sample of historic data and
extrapolate it to cover some broader picture. Thereby these investors disregard the
prospect that coincidence and chance has created this sample hence distorting any
predictions made using it. Such violations against probability theory cause investors to
make flawed estimations and ill-informed investments. (Shleifer, 2000, p.11)

Rationality also involves adjusting to new information. These adjustments need to be
rapid, sufficiently large and the interpretation of the new information needs to be sound.
Yet investors tend to be sluggish to adapt to new information. This lethargic behavior is
inconsistent with what would be expected of a fully rational investor. Besides this a
conservative behavior is also seen when new information arrives. While investors are
generally able to adjust in the correct direction, their adjustment has been seen to be too
conservative. A fully rational investor would be making a larger correction then what
investors in general are doing. (Brealy et al., 2011, p.326)

3.10. Irrationality

Not surprisingly, to behave irrationally can be considered the opposite of behaving
rationally. Irrationality in finance is then when an actor selects non-optimal alternatives
or makes disadvantageous decisions with this actor’s opportunity set and utility taken
into consideration. Many financial models and theory require the static and predictable
nature that rationality generates and therefore assume that all investors and market
participants are rational. These models and theories will then begin to crumble when
irrationality is introduced.

Psychological studies have found many that investors display many different irrational
phenomena. Of relevance here is for example how people value and weight information.
Extremities have been seen to be overweighted, that is extreme information that is
attention-grabbing. It is also common that people do not pay enough attention to the
quality of the information and integrity of the source. Furthermore, people have a
selective approach when interacting with information. “They overweight information
that is consistent with their existing beliefs, are prone to gather information that
supports these beliefs, and readily dismiss information that does not.” (Odean, 1998,
p.1983-1984). In the same way, individual investors coming into contact with analyst
recommendations can be very inclined to follow these. This will be especially true if the
recommendation to some extent support prior beliefs that the investor had. (Odean,
3.11. Behavioral Finance

Towards the 21st century the efficient market hypothesis had lost a lot of ground around world. The belief that at least partial prediction of stock markets is possible was spreading. “A new breed of economists emphasized psychological and behavioral elements of stock-price determination, and they came to believe that future stock prices are somewhat predictable on the basis of past stock price patterns as well as certain "fundamental" valuation metrics.” (Malkiel, 2003, p.60). As economic theory attempts to model human behavior, further emphasis on behavioral finance was desirable. Behavioral finance is concerned with financial theory through the incorporation of psychology and sociology and how this connects with the financial markets (Shiller, 2003, p.83).


Uniting economics and psychology has been fruitful and this rather new field has produced several concepts which help to explain the behavior of investors. These concepts show systematic inconsistencies with how rational investors would act. The psychological approach aids in the explanation of investor behavior when they deviate from the normal economic assumption of rationality. These concepts include overconfidence, herding and anchoring.

3.12.1. Overconfidence

Overconfidence is the occurrence where people misjudge their abilities and have an excessive confidence in the accuracy of their knowledge. Overconfidence has been identified in a massive variety of areas, within anything from investment banking to clinical psychology. Indeed, overconfidence is very common, people have been known to see themselves as better than the average individual and also better then how other people see them. One example was seen in a survey of approximately 3000 business owners who started up recently. When asked about the chance of success of their business the owners gave themselves a 70% chance to succeed. However when they were asked about the success chance for a business like their own they only gave them a 39% chance to succeed (Odean, 1998, p.1892). Which displays how people tend to be overconfident in themselves and overweight their own chances to succeed.

Overconfidence in investing is certainly very common, in fact there may be a disproportionally large amount of overconfident people within the financial markets. This is because there may be a selection bias when people chose whether or not to engage themselves with investments and trading. “People vary in ability and those who believe they have more ability to trade may be more likely to seek jobs as traders or to trade actively on their own account.” (Odean, 1998, p.1896). As self-awareness will vary, those who occupy themselves with investments and trading will be the people with the highest skill and the people who are the most overconfident in their skill. Another reason why traders and investors may be disproportionally overconfident is that success often leads to overconfidence. As with any competitive market, only the successful survive in the market. These surviving traders will often overweight their own contribution to their success causing them to become overconfident. (Odean, 1998, p.1896-1897)
Selecting and trading individual stocks to earn excess returns relative to assets of equivalent risk has been to be incredibly difficult, even impossible. It has been seen that it is people who engage themselves in such difficult situations who tend to display the largest amount of overconfidence. This fact extends far beyond mere individual investors and may be even more valid for professionals and experts. It has been shown that “when predictability is very low, as in the stock market, experts may even be more prone to overconfidence than novices, because experts have theories and models (e.g., of market behavior) which they tend to overweight.” (Odean, 1998, p.1896).

Consequently it is probable that also Placera’s analysts are overconfident, as they are just such experts attempting to achieve excess returns through stock picking. (Odean, 1998, p.1896)

Overconfidence has many implications, both for the investor subjected to it and to the market itself. First of all overconfidence leads to excess trading. Investors who are overconfident establish differing views on the market and this leads to trading. If these investors would have been rational then they would have established the same views on the market which would cause much less trading. Excessive trading has also been found to follow success, and as noted earlier, success breeds overconfidence. (Odean, 1998, p.1911, 1913)

This extreme amount of trading is hurtful and leads to “the lower net returns earned by individual investors whose portfolio turnover is high” (Odean, 1998, p.1913).

It has been seen that active trading overall compared to passive strategies is unprofitable. Overconfidence, unfortunately in most cases, leads investors to active strategies which perform worse than less active and passive strategies. This is especially true when it is expensive to acquire information. Research has shown that investors who purchase such information perform worse than investors who are passive (the cost of acquiring the information is included in the fees of the active investor). Overconfident investors are heavily prone to this type of acquisition and they generally overpay for the information they seek This behavior further reduces the profitability that overconfident investors generate. (Odean, 1998, p.1889, 1911).

Despite both trading actively and excessively, overconfident investors hold undiversified portfolios (Odean, 1998, p.1901). Consequently overconfident investors abstain from possibly the only “free lunch” in the world of finance, the possibility to increase expected return while decreasing the portfolio’s standard deviation.

Overconfidence also impacts the financial markets as a whole through its influence on market efficiency. As overconfident investors do, they will overestimate their skill in terms of analyzing and valuing new information. This misinterpretation leads to systematically positive and negative serially correlated returns, eradicating the random walk of the market and reducing market efficiency. Even though this information is made public and should be incorporated in the market price instead the price drifts further from the intrinsic value of the stock. This is contributed by the irrationality of the overconfident investors. (Odean, 1998, p.1916, 1911-1912)
3.12.2. Herd Behavior

Herd behavior or mutual mimetic contagion is when investors herd by taking an identical position as other investors hold. Through mimicking others, these investors attempt to extract and capitalize on information that others hold. This is despite not knowing whether these other investors are any more skilled and informed than they are (Lux, 1995, p.882). Explanations for this behavior have been that individual investors are ignorant, uniformed and irrational, however the behavior is systematic and a reaction to common opinion (Nofsinger & Sias, p.2263,2265).

Herding exists in two forms and it is not exclusively an irrational mimicking behavior. An unauthentic type of herding can also arise in a situation where investors face similar impressions and information from which they rationally deduce the same decision. Such herding behavior is known as spurious herding, while the intentional herding is “an obvious intent by investors to copy the behavior of other investors” (Bikhchandani & Sharma, 2000, p.281). Yet in the process of when individual investors follow a recommendation, the concept of spurious herding cannot apply. This is a situation where an individual investors partakes in the information and analysis presented by the analysts and not a situation where they independently from each other reach the same conclusion. Hence the characteristics portrayed earlier about individual investors being irrational, uninformed and ignorant seem to fit in better on investors flocking to analyst recommendations. (Bikhchandani & Sharma, 2000, p.281)

Just as the concept of overconfidence, herding as well has an effect on the financial market. Researchers on this subject have seen that herding by investors will “exacerbates volatility, destabilizes markets, and increases the fragility of the financial system.” (Bikhchandani & Sharma, 2000, p.279-280). A further implication of herd behavior is that the initial investors who are first with their choice of direction often set the direction of the whole herd. Therefore the investors who are first to decide play an immense role in the herding process. Herding has also been seen to increase the volatility in the market. This happens when investors herd in the incorrect direction and then ultimately begin investing in the reverse direction to which the whole herd follows. (Bikhchandani & Sharma, 2000, p.279-281)

The most significant implication of herding on the market is the formation of bubbles. “The emergence of bubbles is explained as a self-organising process of infection among traders leading to equilibrium prices which deviate from fundamental values.” (Lux, 1995, p.881). Recurring bubbles contribute significantly to the increases in volatility, in instability of the market and in fragility of the financial system. Also evidence has been seen to give substance to how emotional contagions give up rise to manias. Even among analysts herding and contribution to bubbles has been seen. Analysts have been found to herd especially when the current trend has been bullish. This behavior is thought to be linked to the up rise of frail bubbles and subsequent crashes. (Hirshleifer & Teoh 2001, p.17, 28-29)

3.12.3. Anchoring

Anchoring is a phenomena identified in the psychological process people go through when they make estimates and adjustments to surmise a specific value. People have
been found to often “make estimates by starting from an initial value that is adjusted to yield the final answer.” (Kahneman & Tversky, 1974, p.1128). This starting value might be supposed by the question or problem or it might be absolutely arbitrary. What generally will happen is that people adjust away from this starting value but in an inadequate manner. This process leads to different estimates of the value sought for and these estimates are biased in relation to the starting value. (Kahneman & Tversky, 1974, p.1128)

In some case the starting value has been given an explicitly arbitrary basis but, has still been seen to have significant effect. In one such case participants were asked to estimate the percentage of African countries in the UN. However, first a “wheel-of-fortune” type wheel was spun in the participants’ presence, with numbers ranging from 0-100. Participants were asked to state if the percentage was above or below this completely random number. After that they were asked to estimate the specific percentage of African countries in the UN. The result was that participants receiving low starting numbers estimated a significantly lower percentage than those receiving higher starting numbers. For example the average guess for those receiving 10 as a starting number was 25% while the average guess was 45% for those receiving 65 as a starting number. (Kahneman & Tversky, 1974, p.1128)

Investment anchoring uses this concept to describe what features and factors investors anchor their investment decisions on. There exists an extensive quantity of stocks to select from and an almost equally extensive quantity of factors, figures, ratios, indicators and such to determine an investment decision upon. Thus it becomes practically impossible for investors to systematically scrutinize and evaluate all existing stocks. Therefore investors often make their investment in a stock that has caught their attention somehow. This can be through the news, magazines, analysts’ recommendations or similar. Presumably the most reported and followed feature on the stock market is stock prices and as such the past performance of stock prices is greatly followed and reported. This makes the past performance, or the recent trend of the stock one of the best attention draws. (Odean, 1999, p.24-25)

In an extensive study Odean found that past performance was a decisive factor for many investors’ investments. However he also found that these “strategies” where investors bought stocks with an abnormal past performance trying to ride the positive trend underperformed the market (Odean ,1999, p.22). These strategies are called momentum strategies which entails that the investor buys stocks with a positive recent return and sell stocks with poor recent return, thus trading by following the stock’s momentum. Through research it has been seen that “many investors may overweight the predictive value of price changes; they may see deterministic patterns where none exist, overextrapolate those that do (e.g., momentum), and put too much faith in technical trading rules – though not necessarily the same technical trading rules as each other.” (Odean, 1998, p.1915). Following these types of strategies is inconsistent even with the weak from of the efficient market hypothesis. Consequently it is near at hand to question the rationality of investors following such strategies where they anchor their investment decision based on the trend prior to their purchase (Bikhchandani & Sharma, 2000, p.280).
3.13. Model of Theory

The Model of Theory figure shows how the theories connect together with the real world to form our research question. There are two starting points in the theory, Rationality and Irrationality, where Rationality is the base for the Random walk theory which led to the Efficient market hypothesis. Meanwhile Irrationality among investors gave birth to the Behavioral finance theories. Both the Efficient market hypothesis and the Behavioral finance theories have Anomalies. Anomalies together with Overconfidence among analysts are the reasons for why we see Recommendations.

One group of participants on the Swedish stock market are Individual investors, some of them depend their investment decisions on Analysts´ recommendations, and some of those recommendations are published by Placera. This leads to the question of whether it is rational or irrational to follow Placera’s Recommendations. Thus the research question: Are individual investors rational by following analysts´ recommendations for Swedish stocks? The case of Placera.
Are Individual investors rational by following analysts’ recommendations for Swedish stocks? The Case of Placera
3.14. Sub-research Questions

To conclude this theoretical framework, we have developed five well focused research questions which will be studied to explore in detail the main research question. The first three are mainly concerned with the performance of Placera’s analysts while the final two are theoretical and conceptual (along with a part of the first question concerning overconfidence). This is aligned with the deductive approach.

Main research question:

Are individual investors rational by following analysts’ recommendations for Swedish Stocks?

Sub research questions:

1. Will Placera’s analysts beat the market index?

This is the total performance measurement of Placera’s recommendations. We saw in the previous Swedish study that the analysts failed to beat the market with their buy recommendations but succeeded with the sell recommendations. However, the sell recommendations were outnumbered almost 10 to 1. This will allow us to assess the rationality in following all of Placera’s recommendations and it is also let us evaluate whether Placera’s analysts are overconfident. As was portrayed earlier Placera’s analysts may fit the characteristics of being overconfident. This is because analysts are experts employed in an extremely difficult job, undiversified, trying to beat the index picking individual stocks in a market where predictability is low and in such situations experts are more prone to overconfidence than novices. This would be especially true if Placera’s analysts do not beat the market.

2. Within which firms size category will Placera’s analysts perform the best?

Since previous research done both in Sweden and in the US found that analyst recommendation perform relatively better with small size firms compared to large size firms it is interesting to add on to and follow up these findings. We will then be able to see if this phenomenon continues to exist also for our sample.

3. Will Placera’s analysts perform best in terms of buy or sell recommendations?

In prior studies sell recommendations performing better than buy recommendations was seen to be a significant phenomenon. This may be attributed to overoptimism among analysts, resulting in a higher quantity of buy recommendations which causes these to be in general of lower quality. In the Swedish study the overperformance of the sell recommendations was astounding and consequently it is interesting to see if this pattern continues for Placera’s analysts during a more recent time period.
4. Is it rational to base the decision to follow a recommendation by anchoring on the recent trend of the stock?

It has been seen that a stock’s recent performance is a decisive factor for many investors when selecting stocks to purchase or sell. The rationality of this behavior needs to be evaluated. By viewing how Placera’s recommendations perform categorized by the stocks trend prior to the recommendation a study of this is possible.

1. Does the recommended stock’s risk level affect Placera’s analysts’ performance?

This analysis is interesting to study and see if there are any differences based on the risk level of the stock recommended. This analysis will use Beta as an indicator for risk. As mentioned Small cap have been seen to perform significantly better than mid and large cap. Perhaps a reasons for this could be that Small cap stock are often more volatile and risky. Thus the increased risk level in small stocks could be the reason for the abnormal return seen when comparing to a risk adjusted index?
Chapter 4: Practical Methodology

This chapter strives to outline the practical side of our research method. It describes more specifically what we will do and how we will do it. First off, the sample and time horizon we work with is described and then the way we conducted our data collection is explained. After this we describe the statistical tests which we apply to tests for significance in our sample. These are t-tests and correlation tests along with the assumptions and limitations of these tests. The chapter finishes with the formulation of five hypotheses which stand to be tested.

4.1. Sample

Our study mainly aims to evaluate the rationality of investors following recommendations. Hence our sample consists of a large quantity of recommendations from Placera’s archive. These recommendations are published publicly on Placera and they are made by Placera’s five analysts. A large sample is essential for this research. Due to the effect of the central limit theorem a large sample will improve the chances to attain statistical significance in the study and increase the generalizability of the sample to the population (Aczel & Sounderpandian, 2009, p.221). Due to numerous categories which we divide our sample into it is vital that the sample is large enough for each category to fill up with a significant amount of data. Sell recommendations for example are sparsely published compared to buy recommendations, therefore our collected sample must be so extensive that it covers a substantial amount of sell recommendations as well.

The relevant population in our study is Placera’s entire archive of recommendations, from which we have extracted a sample. In our opinion the two most important factors which were very important in our sampling process, our sample needed to be as large and recent as possible. Therefore we began sampling recent recommendations and worked backwards in time until our sample had reached sufficient size and still was appropriately far from the financial crisis.

Our sample amounts to approximately 450 recommendations. These are divided into buy recommendations and sell recommendations, which are further divided by market size into Large Cap, Mid Cap and Small Cap (and smaller companies) accordingly with the Nasdaq Stockholm OMX stock listings. The buy recommendations amount to circa 88% which is 388 recommendations and are well distributed between the different market sizes. The buy recommendations are distributed as following 44% Large Cap recommendations, 29% Mid Cap recommendations and 27% Small Cap recommendations (which also includes smaller companies listed on Aktiertorget, First North, EGM Equity etc.). However since the sell recommendations only consist of only 12% which is 53 recommendations this quantity is not large enough to be spread among three categories and still maintain statistical significance.

A further categorization of the entire sample is made based upon the risk of the stock. This is done by ranking the recommendations in terms of the stock’s beta and looking for a relationship between the Beta and the realized return. The existence or lack of correlation between these two variables will enable us to analyze the performance of the
analysts within firms of different risk levels and to further assess investor rationality when mimicking analysts.

Finally we will also make a segmentation of the sample based on the trend the stock has followed prior to the recommendation. This is done through calculating the stock’s return during three months up to the point of the recommendation. The recommendations will then be plotted in terms of return before prior to the recommendation and the return post recommendation. We will then test the correlation of this scatter plot. Distributing the sample in this way will allow us to analyze the rationality in anchoring the decision to follow a recommendation based on the trend the stock’s recent trend. This part of the study is something we have not seen done before.

4.2. Time Horizon

Our time horizon begins 2011-01-07 this is when the first recommendation we was published then we continued collecting recommendations from then on up to 2012-09-18 which is when the last collected recommendation was published. After that no more recommendations were collected however since Placera’s analysts make their recommendation on a six months investment horizon therefore the return on each recommendation is calculated based on six months. Therefore even though no more stock recommendations we collected we still needed to collect data until 2013-03-18 which was when the last collected recommendation’s investment horizon finished. Concluding, the time horizon begins in 2011-01-07, recommendations are collected until 2012-09-18, after which only price data and such is collected until 2013-03-18 when the time horizon ends as the last recommendation’s investment horizon closes.

This time horizon was appropriate first of all to ensure that our sample of recommendations would be large and be significant statistically. Second, we wanted to have a time horizon to cover the most recent data possible, to make sure that our study is fresh and contributing in this way. Third, we wanted to stay away from the years which were significantly influenced by the recent financial crisis.

The following figure shows the OMX Stockholm Gross Index during our time horizon from 2011-01-01 to 2013-04-01. By observing this figure we can see that the years from 2011 to 2013 have been quite volatile yet in aggregate the trend of the market over this period is consolidating. Consequently the effects of the financial crisis are minimized as the index has recovered to pre-crisis levels during previous years up to 2011.

![Figure 5. OMX Stockholm Gross Index during our time horizon](Source: NasdaqOMXNordic (2013))

4.3. Data Collected and Collection Method
To be able to conduct this study we needed to collect several different types of secondary data. The sample of Placera’s stock recommendations from their archive was very essential data. This was done manually by going through the archive of recommendations and entering the data into Excel. What we collected was the price of the stock 3 months prior to the recommendation (to be able to calculate the trend prior to the recommendation), the stock price at the time of the recommendation and the stock price at the finishing point of the recommendation which is 6 months after the recommendation was made (since the investment horizon of a recommendation is 6 months). Then in order to find the abnormal performance of the recommendations the price of the market index was also collected. This was done on the same three periods as the stock price which is 3 month prior to the recommendation, the time of the recommendation and 6 months after the recommendations. The prices of the stock and the index were then used to calculate the simple return of each recommendation and the index over the same period.

The Stockholm OMXS GI index is used because this is an all-share index including all stocks on the Swedish stock market (NasdaqOMX Nordic, 2013). Furthermore the GI stands for gross index in which the index does not adjust when a stock pays dividends, instead dividends are reinvested. This properly takes dividends into account compared to the Stockholm OMXS PI which is a price index that will adjust down equally to the amount a firm pays out in dividends which will decrease the return of this index (over a period where dividends was paid). If a recommended stock had a dividend payout during the covered investment horizon then this dividend return was added back manually to the return of the stock. Thus we have adjusted for dividend payouts and fully taken these into account.

As an indicator for the risk level of a stock the beta number will be used. The beta measures the stocks’ sensitivity to changes in a market index. Thus a high beta stock will have a high sensitivity to changes in the index which means it will be very volatile and risky. To be able to compare stocks of different risk levels to the market index a risk adjusted return is calculated. This is the return divided by the stock’s beta, which causes high beta (high risk) stocks to be adjusted downward because the required expected return is higher. This will allow for a comparison between individual stocks to and the market index to analyze the analysts’ performance relative to the performance market index. (Brealey et al., 2011, p.174 & 318)

The size segmentation was done using the same segmentation for size which the OMX Stockholm Index uses which is the official listings Large Cap, Mid Cap and Small Cap listings. The Cap stands for capitalization which means that the segmentation is done based on the Market Capitalization, the market value. The firms with the largest market capitalization in the Large Cap, middle in the Mid Cap and small in the Small Cap. A few recommendations were made on companies listed on other minor lists such as First North or Aktietorget, due to their small market capitalization these have been included under the Small cap segment in our study.

As mentioned, our data is exclusively secondary which has been collected by someone else. However now we combine and utilize different types of secondary data to form our sample and make quantitative analysis. Our data consists of Placera’s recommendations, stock prices, other stock related numbers (dividends, betas etc) and index prices. The
recommendations have been gathered from Placera’s public archive. The stock prices have also been collected using BörsData. Dividends were found through the companies’ annual reports for the year in question and also through the website Aktieutdelningar. Beta numbers were acquired from Avanza bank’s website. These beta numbers are calculated using the returns of the Stockholm OMX index, the returns of the stock in question and a time period of the last three years. This data was all collected manually and if the 6 month investment horizon ended on a weekend then the following weekday was used. The Stockholm OMXS GI index prices were downloaded to a spreadsheet from the Nasdaq OMX website. This data has been input into an Excel spreadsheet and categorized depending on whether the recommendation is a buy or sell recommendation and if it is a large, mid or small cap stock. Another sheet will categorize all the different recommendations based on their risk level using the beta.

4.4. Calculation of return

In our study we will use simple returns, when calculating the return of a stock recommendation. The formula for this is:

\[
\text{Simple return} = \frac{(t_1 + \text{div} - t_0)}{t_0}
\]

\(t_1\) = Stock price at the end of the recommendation
\(\text{div}\) = Dividend
\(t_0\) = Stock price at the start of the recommendation

We use simple returns as they have several advantages for our study. First of all we have individual investors as our perspective where simple return has a superior practical use compared to logarithmic returns. But the most important reason to use simple returns instead of logarithmic returns is that the log returns become more distorted with extreme stock returns. This had a large effect on our results, an effect which was minimized with the use of simple returns. The use of logarithmic returns usually leads to normally distributed data however with the distortion effect of extreme returns the amount of extreme outliers may become unmanageable.

As mentioned, to be able to compare the returns of a recommended stock and the return of the index we must adjust for the risk. This will make the comparison between the index and the stock a fair competition. As an indicator for risk we use Beta. The beta represents a stock’s sensitivity to index movements and is therefore great for adjusting the stock’s risk level to the index’s risk level. The adjustment is made by dividing the index return and the stock’s return by its respective beta. This will adjust the return of high risk stocks and adjust up the return of low risk stocks, making them comparable. The index has a beta of 1 as it is perfectly diversified and therefore contains only market risk and no firm specific risk whatsoever. So the index return over a given period is divided by 1 while the stock’s return is divided by its own beta. Consequently for the analysts to beat the market it is not enough that they pick high risk stocks and see expected results, additionally they must beat the market as if it had an equal risk level as the chosen stock.

The Beta (\(\beta\)) used when adjusting our returns for risk is calculated as followed:
Beta (β) = \frac{\text{Cov} (r_s, r_m)}{\text{Var} (r_m)}

\text{Cov} = \text{Covariance}
\text{r}_s = \text{Rate of return for the stock}
\text{r}_m = \text{Rate of return for the market}
\text{Var} = \text{Variance}

In our study we have used the realized average risk adjusted return (RARAR) as a measure for the returns of the recommendations. RARAR is risk compensated by using beta to be able to compare stocks of different risk levels to one another. RARAR works as a mean return of our different categories.

The most commonly used return in our study is abnormal RARAR. Abnormal RARAR is the realized average risk adjusted return minus the average index return. This works as a comparison of the return from the recommendation to the return from the index, to be able to determine whether the analysts beats the market.

**Codification:**

**RARAR:** Realized Average Risk Adjusted Return
**Index Return:** Index Return over the recommendation period (6 months)
**Abnormal Return:** RARAR – Index Return

The abnormal RARAR for buy recommendations is calculated as follows:

Abnormal RARAR = Mean of (Simple return – index return x β)

The abnormal RARAR for sell recommendations is calculated as follows:

Abnormal RARAR = Mean of (Simple return x (-1) – index return x β)

### 4.5. Statistical analysis

To analyze our data and be able to draw conclusions from it we must apply statistical tools. As our collected data is a sample from a population we will test the significance that the sample represents the population. This indicates the sample’s explanatory power of the population and tells with a specified significance level the probability that the sample has been drawn by coincidence or whether it actually describes the characteristics of its population.

#### 4.5.1. Testing for Significance

To test the statistical importance of our results we will apply significance testing. Significance testing will give an indication of how probable it is that the parameters of the collected sample represent the actual parameters of the population (Moore & McCabe, 1999, p.453). These tests assess how likely it is to have received a result simply by chance or whether the result is actually statistically valid. The hypotheses which will be tested are statements regarding the parameters of the population.
4.5.2. Parametric test: t-Test

The t-Test is used in statistics to test hypotheses when the research aims at comparing the difference between two samples or populations. It is most commonly used when the standard deviation of the sample or population is unknown and the data follow a normal distribution. The t-Test gives information regarding the chance that the characteristics of the sample are representative of the characteristics of the population. Another way of looking at it is that it gives information regarding the risk that the characteristics of the sample have occurred only by chance and therefore the sample does accurately represent the population. In such instances the sample is cannot be used to draw conclusions about the population. The t-Test tests whether or not the null hypothesis can be rejected. To test if the null hypothesis that the mean of the population is different from a specified value, the following formula is used:

\[ T = \frac{\overline{X} - \mu_0}{s / \sqrt{n}} \]

where:
- \( \overline{X} = \) sample mean,
- \( \mu_0 = \) Test value
- \( s = \) sample standard deviation of the sample
- \( n = \) sample size.

The degrees of freedom used in this test is \( n - 1 \).

We will apply the t-test, to test if the analysts’ performance is significantly different from 0. If the abnormal RARAR is positive and significantly different from 0 then the analysts have beaten the market index. If the abnormal RARAR is negative and significantly different from 0 then the analysts have been outperformed by the index. Finally, if the abnormal RARAR (regardless of whether it is positive or negative) is not significantly different from 0, then there is no significant difference between the RARAR of the recommendations and the market index return.

4.5.3. Non-Parametric test: Wilcoxon test

Non-parametric tests are used in cases where the sample data does not fulfill the assumptions required by parametric tests. As such, non-parametric tests have no distributional assumptions and are superior at handling non-normal data. However non-parametric tests incorporate less information from the sample which can make these tests less powerful than conventional parametric tests. With this in mind the non-parametric tests will be used supplementary to the parametric tests. Since when collecting such a large sample of stock returns, there is a large chance for extreme outliers and stock returns are in their nature asymmetric as they have an unlimited potential upside yet a limited downside. These issues cause the risk of the sample forming a non-normal, skewed or outlier-affected distribution and in such a case to
further ensure the results and conclusions of the study, supplementary non-parametric tests will be conducted. (Aczel & Sounderpandian, 2009, p.663-664)

The two tailed one sample Wilcoxon signed rank test is what we will conduct on our sample. What this test does is that it ranks all the observations in the sample and then tests if the median (instead of the mean) is statistically different from the test value (which will be set to 0). Thus the null hypothesis will state that the median is not different from 0, and the alternative hypothesis will say that the median is different from 0. The rejection rule is the same, if the test statistic is lower than the pre-specified critical value we reject he null hypothesis. (Aczel & Sounderpandian, 2009, p.683,686)

4.5.4. Normal Distribution

An essential assumption of the model is that the variables are normally distributed. Due to the effect of the Central Limit Theorem (CLT) the sample size, as it increases, will converge to a normal distribution (Aczel & Sounderpandian, 2009, p.220-221). “In general, a sample of 30 or more elements I considered large enough for the central limit theorem to take effect.” (Aczel & Sounderpandian, 2009, p.221). Fortunately our sample amounts to approximately 450 recommendations which thereby puts our sample far within the effect of the central limit theorem. As we will also make several segmentations and divisions, in the tables below we have review if the CLT applies to the segment or not. Only two segments are too small for the CLT to apply this are the Sell Large Cap and Sell Mid Cap. For these two segments, parametric tests will not be appropriate meanwhile the CLT applies for all the other segments. Although our distributions will also be tested for normality.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>N&gt;30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Total</td>
<td>441</td>
<td>Yes</td>
</tr>
<tr>
<td>Large Cap</td>
<td>186</td>
<td>Yes</td>
</tr>
<tr>
<td>Mid Cap</td>
<td>118</td>
<td>Yes</td>
</tr>
<tr>
<td>Small Cap</td>
<td>137</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>N&gt;30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>388</td>
<td>Yes</td>
</tr>
<tr>
<td>Large Cap</td>
<td>170</td>
<td>Yes</td>
</tr>
<tr>
<td>Mid Cap</td>
<td>113</td>
<td>Yes</td>
</tr>
<tr>
<td>Small Cap</td>
<td>105</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>N&gt;30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>53</td>
<td>Yes</td>
</tr>
<tr>
<td>Large Cap</td>
<td>16</td>
<td>No</td>
</tr>
<tr>
<td>Mid Cap</td>
<td>5</td>
<td>No</td>
</tr>
<tr>
<td>Small Cap</td>
<td>32</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 9. If Central Limit Theorem (CLT) applies
Source: Made by Authors

4.5.5. Tests for Normality
One of the most commonly used methods to evaluate a sample's normality are, by the use of graphical methods. There are different ways of graphical methods, one commonly used is assessing the normality by visually observing the sample's distribution plotted in a histogram. The use of graphical methods can be of good use when evaluating normality, but they do not provide evidence of normality. Consequently, the graphical method should be strengthened with a normality test. A normality test evaluates whether or not the collected data follows a normal distribution to a certain level of significance. Two of the most accepted and commonly used tests are Shapiro-Wilk test and Kolmogorov-Smirnov test, and these are the tests we have decided to work with. (Razali & Wah 2011, p. 21-22)

The Kolmogorov-Smirnov test is an Empirical distribution function (EDF) test, which tests normality by comparing the estimated empirical distribution function with the cumulative distribution function of normal distribution to evaluate the relationship between them.

\[ T = \sup_x |F^*(x) - F_e(x)| \]

\[ H_0: F(x) = F^*(x) \]

\[ H_1: F(x) \neq F^*(x) \]

T = Test statistics  
\( \sup_x \) = Supremum  
F*(x) = Hypothesized distribution function  
F_e(x) = EDF

If the test results are over 0.05 the sample is normally distributed, and reject the null hypothesis if the results are lower than 0.05. (Razali & Wah 2011, p. 22-23)

A good complement to the Kolmogorov-Smirnov test is the Shapiro-Wilk test which is able to discover deviations from normality due to skewness and/or kurtosis. It has become a commonly used test due to its favorable power properties and an ability to handle large samples. The rejection rule is the same, a result over 0.05 indicates normality, meanwhile a lower then 0.05 leads to a rejection of the null hypothesis. (Razali & Wah 2011, p. 25)

4.5.6. Limitations of Significance Tests

Significance tests are subject to certain limitations and they can certainly be abused at times. First of all if the data collection is somehow defective, heavily biased or likewise then a test on this data will be invalid. Second, significance tests are not resistant to outliers, consequently the results of the tests can be substantially distorted by such extremities. Third, even though these tests aim to rule out chance, if many tests are run parallel to each other than inevitably and solely chance these tests will result in significance. Fourth, one must realize a difference between practical and statistical significance as a very small relationship or effect may be statistically significant but not practically significant. And last, it is important to understand the implications of significance tests since if a test does not result in statistical significance the implication is not that H0 is true. This is even more critical if the test has low power. (Moore & McCabe, 1999, p.481)
4.6. Correlation

Correlation is a measure of the linear relationship amongst two variables. If the relationship is strong, for positive correlation then the variables will move in the same direction, if one increases the other also increases and vice versa. Two such variables would have a high correlation, on the other hand two variables with a weaker association will have a lower correlation. The indicator for correlation is the correlation coefficient which is a number between 1 which is perfect correlation (the variables move perfectly well together) to -1 which is perfect negative correlation (the variables move directly opposite to each other). A correlation coefficient of 0 indicates that there is not relationship between the variables. The correlation coefficient is calculated as:

\[ \rho = \frac{Cov(X,Y)}{\sigma(X) \times \sigma(Y)} \]

Cov = Covariance
\( \sigma \) = Standard deviation
\( \rho \) = Correlation coefficient
X, Y = Variables

In the pictures below different scatterplot examples of correlation are presented. In these scatterplots, observed data is plotted according to its x- and y-axel value and the the correlation of the sample is calculated as r. The correlation coefficients range from very strong positive correlation at r = 0.95 which is the first large picture and then become less and less correlated. Ending up with the last picture which shows a correlation coefficient r = 0.

Figure 6. Example of strong positive correlation

Source: (Miles & Shevlin, 2004, p.22)
4.6.1. Test of Correlation

Since our data is a sample we will test the significance of the correlation to assess whether the correlation in the sample occurred by chance alone or if it actually represents the correlation within the population. We will use Pearson’s correlation which is the most commonly used measure for correlation. The primary competitor to this measure is Spearman’s correlation, which however ranks the observations and therefore does not factor in the distance between two variables. While the Pearson’s correlation takes outliers for example into account which is desirable, as when dealing with stock returns outliers are inevitable, not one time occurrences. Thus Pearson’s correlation serves our purposes better as our sample of returns may have a wide spread distribution. This test assumes that the two variables are normally distributed and the formula for this significance test is the following: (Aczel & Sounderpandian, 2009, p.461)

\[
T_{(n-2)} = \frac{r}{\sqrt{(1-r^2) / (n-2)}}
\]

- **T** = Test statistics
- **r** = Return
- **n** = number of observations

The null hypothesis we test states that \( r = 0 \) and the alternative hypothesis states that \( r \neq 0 \). We will use this to test the statistical significance of the sample’s correlation using a
critical value of 0.05 since it is the most commonly accepted in research in business administration. If the probability of this correlation occurring due to chance is higher than 0.05 then the correlation is not statistically significant and the null hypothesis accepted. While if the probability is low, we accept the statistical significance of the correlation and that it is not equal to 0. (Saunders et al., 2009, p. 364)

4.6.2. Limitations to Correlation Analysis

Correlation analysis is prone to several limitations. The first of these is that both the variables that one is analyzing in the correlation need to be in numerical form, correlation cannot be calculated between categorical variables for example. Further the correlation coefficient is always in the range of -1 to 1. Another matter is that correlation can only be an indicator of the strength of a linear relationship. Correlation cannot measure a non-linear relationship regardless of the strength of this relationship. Lastly, correlation is sensitive to outliers, only a few extremities can significantly affect the correlation. (Moore & McCabe, 1999, p.128-129)

4.7. Hypotheses:

The above described statistical tools will be used to test the following hypotheses. The hypotheses have all been developed from the main research question and the sub-research questions outlined in chapter 3.

Codification:
RARAR: Realized Average Risk Adjusted Return
Index Return: Index Return over the recommendation period (6 months)
Abnormal Return: RARAR – Index Return

1. There is no difference between the realized average risk adjusted return when following analyst recommendations and the market index.
   \( H_0: \text{RARAR} – \text{Index Return} = 0 \)
   \( H_1: \text{RARAR} – \text{Index Return} \neq 0 \)
   \( \text{RARAR} – \text{Index Return} < 0 \)
   \( \text{RARAR} – \text{Index Return} > 0 \)

In prior research, analysts failed to beat the market therefore the null hypothesis states that there will not be a significant difference between the analysts’ performance and the market index, in other words the difference will be zero. While with the alternative hypothesis we will see if there is statistical significance for that there is a difference between the analysts’ and the index.

2. There is no difference between the return that the analysts realize depending on different firm sizes.
   Large Cap:
   \( H_0: \text{Large Cap RARAR} – \text{Index Return} = 0 \)
   \( H_1: \text{Large Cap RARAR} – \text{Index Return} \neq 0 \)
   If \( H_1 \) is accepted then:
   \( \text{Large Cap RARAR} – \text{Index Return} < 0 \) or
   \( \text{Large Cap RARAR} – \text{Index Return} > 0 \)
   Mid Cap:
H₀: Mid Cap RARAR – Index Return = 0
H₁: Mid Cap RARAR – Index Return ≠ 0
If H₁ is accepted then:
   Mid Cap RARAR – Index Return < 0 or
   Mid Cap RARAR – Index Return > 0

Small Cap:
H₀: Small Cap RARAR – Index Return = 0
H₁: Small Cap RARAR – Index Return ≠ 0
If H₁ is accepted then:
   Small Cap RARAR – Index Return < 0 or
   Small Cap RARAR – Index Return > 0

In prior research a significant phenomenon has been seen which is that recommendations for Small Cap stocks substantially outperformed Mid and Large Cap. We will test if this phenomenon has occurred for our sample as well.

3. There is no difference between the return that the analysts realize depending on whether the recommendation is to buy or to sell.

Buy Recommendations:
H₀: Buy RARAR – Index Return = 0
H₁: Buy RARAR – Index Return ≠ 0
If H₁ is accepted then:
   Buy RARAR – Index Return < 0 or
   Buy RARAR – Index Return > 0

Sell Recommendations:
H₀: Sell RARAR – Index Return = 0
H₁: Sell RARAR – Index Return ≠ 0
If H₁ is accepted then:
   Sell RARAR – Index Return < 0 or
   Sell RARAR – Index Return > 0

The other most significant phenomenon seen previously is that sell recommendations significantly outperform buy recommendations. With this hypothesis we have targeted this phenomenon to test it on our data.

4. There is no correlation between the trend of a stock prior to the recommendation and the performance of the recommendation.
H₀: Correlation = 0 H₁: Correlation ≠ 0

This hypothesis will be tested because investors have been found to put significant weight upon the trend of a stock and anchoring their investment decision on this factor. By analyzing the correlation between the recommendations’ performance and the stocks’ performance we will be able to conclude on the rationality of such behavior.

5. There is no correlation between the beta of a recommended stock and the performance of the recommendation.
H₀: Correlation = 0 H₁: Correlation ≠ 0
This final test is to analyze the correlation between the stocks’ beta and performance to see if a relationship exists. This would give an indication of whether a stock recommendations’ risk level is related to its performance which could help investors following recommendations.
Chapter 5: Empirical Results

In this chapter we outline in a structured and scientific way the empirical results of our research. First we present the simple abnormal RARAR produced by our different categories of recommendations. This part is followed by the results of a test of normality throughout our sample. Next we show the level of significance for the simple abnormal RARAR, by using t-Test and Wilcoxon test. The final part of the Chapter contains correlation results of between Trend and abnormal RARAR, Beta and abnormal RARAR.

5.1. Placera’s Performance

In the tables below, the performance of Placera’s recommendations presented during 2011-01-07 to 2012-09-18. This performance is measured as abnormal RARAR in comparison to the OMX GSI index over the same period. In the table the totals are presented, that is the total of the whole sample and the totals of Large, Mid and Small Cap. The second table includes the buy recommendations, segmented by Total, Large Cap, Mid Cap and Small Cap. Finally the third table presents the results of the Sell recommendations, also segmented in the same fashion.

<table>
<thead>
<tr>
<th>Total</th>
<th>Abnormal RARAR</th>
<th>N = 441</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0,00474</td>
<td>441</td>
<td>100,00%</td>
</tr>
<tr>
<td>Large Cap</td>
<td>-0,0043</td>
<td>186</td>
<td>42,18%</td>
</tr>
<tr>
<td>Mid Cap</td>
<td>-0,0136</td>
<td>118</td>
<td>26,76%</td>
</tr>
<tr>
<td>Small Cap</td>
<td>0,03281</td>
<td>137</td>
<td>31,07%</td>
</tr>
</tbody>
</table>

Table 10. Results from All recommendations

Source: Made by Authors

Here in the Total results we see that the abnormal RARAR for all the 441 recommendations is approximately 0, even slightly positive. The Large Cap results are also close to 0 at a negative abnormal RARAR of -0,43%. The results start to deviate more from 0 with the Mid Cap at -1,36% and even more with the Small Cap at a 3,28%. The 441 recommendations are fairly evenly distributed among the three firm size categories yet with a slightly large representation as 42,18% is Large Cap stocks.

<table>
<thead>
<tr>
<th>Buy</th>
<th>Abnormal RARAR</th>
<th>N = 388</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>-0,0168</td>
<td>388</td>
<td>100%</td>
</tr>
<tr>
<td>Large Cap</td>
<td>-0,0004</td>
<td>170</td>
<td>44%</td>
</tr>
<tr>
<td>Mid Cap</td>
<td>-0,0213</td>
<td>113</td>
<td>29%</td>
</tr>
<tr>
<td>Small Cap</td>
<td>-0,0386</td>
<td>105</td>
<td>27%</td>
</tr>
</tbody>
</table>

Table 11. Results from Buy recommendations

Source: Made by Authors

In this table we have segmented the Buy recommendations which in total had an abnormal RARAR of -1,68%. The buy recommendations on Large Cap stocks had an abnormal RARAR very close to 0. The Mid Cap buy recommendations performed
worse than the index by -2.13% and even worse for the Small Cap stocks which show a -3.86% abnormal RARAR. The buy recommendations are distributed evenly, with a small excess of Large Cap recommendations.

<table>
<thead>
<tr>
<th>Sell</th>
<th>Abnormal RARAR</th>
<th>N = 53</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.16248</td>
<td>53</td>
<td>100.00%</td>
</tr>
<tr>
<td>Large Cap</td>
<td>-0.0457</td>
<td>16</td>
<td>30.19%</td>
</tr>
<tr>
<td>Mid Cap</td>
<td>0.15946</td>
<td>5</td>
<td>9.43%</td>
</tr>
<tr>
<td>Small Cap</td>
<td>0.26707</td>
<td>32</td>
<td>60.38%</td>
</tr>
</tbody>
</table>

Table 12. Results from Sell recommendations

Source: Made by Authors

In this last table we find that the Small Cap recommendations outperformed the index by 16.25%. The Large Cap sell recommendations however did not contribute to this total and instead brought it down by showing a -4.57% abnormal RARAR. The Mid Cap recommendations did better with 15.95% abnormal RARAR and the Small Cap better yet, amounting to 26.7%. As expected the sample of 53 Sell recommendations is much smaller than the sample of 388 Buy recommendations. The segmentation becomes almost redundant as the distribution is very uneven as the Mid Cap recommendations amount to only 9.43% of the sample while the Small Cap make up as much as 60.38% of the sample.

5.2. Test of Normality

To further assess these results and extend their implications, statistical significance is required which is attained through statistical testing. The common type of significance tests assume normality, that is that the data comes from a normally distributed population. This requires us to test whether our data sample comes from a normally distributed population or not.

The hypotheses were:

H₀: The data comes from a normally distributed population.
H₁: The data does not come from a normally distributed population.

We carried out four normality tests on our sample. First on the Total, which includes all the 441 recommendations, then individually on the Large Cap stocks, Mid Cap stocks and Small Cap stocks. Using a 5% level of significance we reject the null hypothesis if the test statistic is below 0.05 and retain the null hypothesis if the test statistic is above 0.05. The test results are shown in the tables and histograms below.

5.2.1. Normality test: Total Recommendations

<table>
<thead>
<tr>
<th>Cases</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
<td>-----</td>
<td>---------</td>
</tr>
<tr>
<td>440</td>
<td>99.8%</td>
<td>1</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

**Table 13.** Case Processing Summary, Total Recommendations  
**Source:** Made by Authors in SPSS

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Statistic</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>-.0056</td>
<td>.01179</td>
</tr>
<tr>
<td>95% Confidence Interval</td>
<td>Lower Bound</td>
<td>.0288</td>
</tr>
<tr>
<td>Mean</td>
<td>Upper Bound</td>
<td>.0176</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>-.0089</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>-.0096</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>.061</td>
<td></td>
</tr>
<tr>
<td>Total Std. Deviation</td>
<td>.24721</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>-1.17</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>1.11</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>2.28</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>.23</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>.235</td>
<td>.116</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>4.602</td>
<td>.232</td>
</tr>
</tbody>
</table>

**Table 14.** Descriptives, Total Recommendations  
**Source:** Made by Authors in SPSS

<table>
<thead>
<tr>
<th>Kolmogorov-Smirnov(^a)</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistic</td>
<td>df</td>
</tr>
<tr>
<td>Total</td>
<td>.091</td>
</tr>
</tbody>
</table>

\(^a\) Lilliefors Significance Correction

**Table 15.** Tests of Normality, Total Recommendations  
**Source:** Made by Authors in SPSS
Figure 8. Normality distribution of Abnormal RARAR for Total Segment

Source: Made by Authors in SPSS

For the Total recommendations the test for both the Kolmogorov-Smirnov and Shapiro-Wilk tests the significance level is below the critical value of 0.05 and consequently we reject the null hypothesis that the data comes from a normally distributed population. The histogram presented shows the distribution of the sample data. The shape of the distribution actually is very similar to the shape of a normal distribution, the main difference being that observations around the mean are too frequent making the middle columns too high. Also because of the sample’s size, which is far greater than the required number of 30 for the Central Limit Theorem to apply, the sample’s mean becomes approximately normally distributed. One very extreme outlier was removed because it distorted the sample and the sample’s standard deviation.
5.2.2. Normality test: Large Cap

<table>
<thead>
<tr>
<th>Cases</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
</tr>
<tr>
<td>LargeCap</td>
<td>186</td>
<td>100.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 16. Case Processing Summary, Large Cap
Source: Made by Authors in SPSS

<table>
<thead>
<tr>
<th>Statistic</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>-0.004294</td>
<td>0.0147557</td>
</tr>
<tr>
<td>95% Confidence Interval for Mean</td>
<td>Lower Bound: -0.033405</td>
<td>Upper Bound: 0.024818</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>-0.006704</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>-0.004000</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>0.040</td>
<td></td>
</tr>
<tr>
<td>LargeCap</td>
<td>Std. Deviation: 0.201211</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>-1.1676</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>1.1079</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>2.2755</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>0.1728</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>0.478</td>
<td></td>
</tr>
<tr>
<td>Kurtosis</td>
<td>13.364</td>
<td></td>
</tr>
</tbody>
</table>

Table 17. Descriptives, Large Cap
Source: Made by Authors in SPSS

| Kolmogorov-Smirnov | Shapiro-Wilk |
|---|---|---|---|
| Statistic | df | Sig. | Statistic | df | Sig. |
| LargeCap | 0.128 | 186 | 0.000 | 0.820 | 186 | 0.000 |

a. Lilliefors Significance Correction

Table 18. Tests of Normality, Large Cap
Source: Made by Authors in SPSS
Figure 9. Normality distribution of Abnormal RARAR for Large Cap Segment

Source: Made by Authors in SPSS

The outcome of the normality test for the Large Cap segment was very similar to the Total. Both the Kolmogorov-Smirnov and Shapiro-Wilk compute a significance level below the critical value of 0.05 and consequently we reject the null hypothesis that the data originate from a normally distributed population. The deviations from normality are easily spotted in the histogram, first of all the frequency around the mean is too high. Second, there are two extreme outliers, one in each direction. When we remove the three outliers, the Kolmogorov-Smirnov test deems the sample as normal.

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnov*</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>LargeCap</td>
<td>.054</td>
<td>.200</td>
</tr>
<tr>
<td></td>
<td>183</td>
<td>183</td>
</tr>
<tr>
<td></td>
<td>.982</td>
<td>.018</td>
</tr>
</tbody>
</table>

* This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 19. Tests of Normality, Large Cap (removed outliers)

Source: Made by Authors in SPSS
### 5.2.3. Normality test: Mid Cap

<table>
<thead>
<tr>
<th>Cases</th>
<th>Valid</th>
<th>Missing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
</tr>
<tr>
<td>MidCap</td>
<td>118</td>
<td>100,0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>100,0%</td>
<td></td>
</tr>
</tbody>
</table>

**Table 20. Case Processing Summary, Mid Cap**

**Source:** Made by Authors in SPSS

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Mean</th>
<th>Std. Error</th>
<th>95% Confidence Interval for Lower Bound</th>
<th>95% Confidence Interval for Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>-0.013596</td>
<td>0.0202965</td>
<td>-0.053792</td>
<td>0.026600</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>-0.015907</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>0.049</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>-0.015050</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statistic</th>
<th>MidCap Std. Deviation</th>
<th></th>
<th>MidCap Minimum</th>
<th>-0.7072</th>
<th>MidCap Maximum</th>
<th>0.8766</th>
<th>MidCap Range</th>
<th>1.5838</th>
<th>MidCap Interquartile Range</th>
<th>0.2415</th>
<th>MidCap Skewness</th>
<th>0.282</th>
<th>MidCap Kurtosis</th>
<th>2.373</th>
<th></th>
</tr>
</thead>
</table>

**Table 21. Descriptives, Mid Cap**

**Source:** Made by Authors in SPSS

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Kolmogorov-Smirnova</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistic</td>
<td>df</td>
<td>Sig.</td>
</tr>
<tr>
<td>MidCap</td>
<td>0.079</td>
<td>118</td>
</tr>
</tbody>
</table>

a. Lilliefors Significance Correction

**Table 22. Tests of Normality, Mid Cap**

**Source:** Made by Authors in SPSS
In the Mid Cap segment we see some differences, first of all the Kolmogorov-Smirnov test’s significance level is above the required 0.05 critical level and thus we accept the null hypothesis that the sample comes from a normally distributed population. The significance level of the Shapiro-Wilk test however falls below the required 0.05 critical level and rejects the null hypothesis. The sample distribution displayed in the histogram conforms quite well to a normal distribution yet two outliers and other minor deviations exist.

5.2.4. Normality test: Small Cap

<table>
<thead>
<tr>
<th>Cases</th>
<th>Valid</th>
<th>Missing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
</tr>
<tr>
<td>SmallCap</td>
<td>136</td>
<td>100.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 23. Case Processing Summary, Small Cap

Source: Made by Authors in SPSS
<table>
<thead>
<tr>
<th>Statistic</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>-0.000422</td>
</tr>
<tr>
<td>95% Confidence Interval for Mean</td>
<td>-0.054323</td>
</tr>
<tr>
<td>Mean Lower Bound</td>
<td>0.053478</td>
</tr>
<tr>
<td>Mean Upper Bound</td>
<td></td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>-0.001621</td>
</tr>
<tr>
<td>Median</td>
<td>-0.021800</td>
</tr>
<tr>
<td>Variance</td>
<td>0.101</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.3178363</td>
</tr>
<tr>
<td>Minimum</td>
<td>-0.9124</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.9552</td>
</tr>
<tr>
<td>Range</td>
<td>1.8676</td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>0.3713</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.091</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.539</td>
</tr>
</tbody>
</table>

Table 24. Descriptives, Small Cap

Source: Made by Authors in SPSS

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Kolmogorov-Smirnova</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistics</td>
<td>df</td>
</tr>
<tr>
<td></td>
<td>Statistic</td>
<td>df</td>
</tr>
<tr>
<td>SmallCap</td>
<td>0.072</td>
<td>136</td>
</tr>
</tbody>
</table>

a. Lilliefors Significance Correction

Table 25. Tests of Normality, Small Cap

Source: Made by Authors in SPSS
The normality tests for the Small Cap segment also result in different outcomes. The sample tests normal according to the Kolmogorov-Smirnov test while the Shapiro-Wilk test rejects the null hypothesis as the significance level is below 0.05. The histogram shows that there is a heavy concentration around the mean and a steep drop off towards the tails. The outlier removed stems from the Small Cap and thus it is removed here as well.

To conclude regarding these normality tests, our results showed clear tendencies towards normality and as CLT applies for all segments, the samples’ means become approximately normal. To ensure that our sample distributions do not lead to false conclusions we will conduct both parametric tests (t-Test) and non-parametric tests (Wilcoxon test) to test our hypotheses.

5.3. t-Test

We conducted the two tailed one sample t-Tests with a 0.05 critical level to test our hypotheses. The results of these tests can be seen in the tables below. We have segmented the results into Total, Buy and Sell and further divided these into Large, Mid and Small Cap.
5.3.1. **t-Test: Total Recommendations**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>440</td>
<td>-.0056</td>
<td>.24721</td>
<td>.01179</td>
</tr>
<tr>
<td>LargeCap</td>
<td>186</td>
<td>-.0043</td>
<td>.20124</td>
<td>.01476</td>
</tr>
<tr>
<td>MidCap</td>
<td>118</td>
<td>-.0136</td>
<td>.22048</td>
<td>.02030</td>
</tr>
<tr>
<td>SmallCap</td>
<td>136</td>
<td>-.0004</td>
<td>.31784</td>
<td>.02725</td>
</tr>
</tbody>
</table>

**Table 26. One-Sample Statistics, Total Recommendations**

Note: The differences in mean, within the Total and within the Small Cap in this table and the table above is due to the removal of the outlier.

**Source:** Made by Authors in SPSS

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Total</td>
<td>-.474</td>
<td>439</td>
<td>.635</td>
<td>-.00559</td>
<td>-.0288</td>
</tr>
<tr>
<td>LargeCap</td>
<td>-.291</td>
<td>185</td>
<td>.771</td>
<td>-.00429</td>
<td>-.0334</td>
</tr>
<tr>
<td>MidCap</td>
<td>-.670</td>
<td>117</td>
<td>.504</td>
<td>-.01360</td>
<td>-.0538</td>
</tr>
<tr>
<td>SmallCap</td>
<td>-.015</td>
<td>135</td>
<td>.988</td>
<td>-.00422</td>
<td>-.0543</td>
</tr>
</tbody>
</table>

**Table 27. One-Sample t-Test, Total Recommendations**

**Source:** Made by Authors in SPSS

In this segment it is statistically significant that the mean relates to the test value. The significance level of the abnormal RARAR of Small Cap recommendations was almost 1, the abnormal RARAR of the Large Cap segment had a 0.771 significance level, the abnormal RARAR of the Total segment had a 0.635 significance level and finally the significance level of the abnormal RARAR of the Mid cap recommendations was 0.504. Consequently all segments are statistically significant as the significance level of each segment’s abnormal RARAR is above the critical level at 0.05.

5.3.2. **t-Test: Buy Recommendations**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>BuyTotal</td>
<td>387</td>
<td>-.028610</td>
<td>.2233177</td>
<td>.0113519</td>
</tr>
<tr>
<td>BuyLargeCap</td>
<td>170</td>
<td>-.000393</td>
<td>.1810517</td>
<td>.0138860</td>
</tr>
<tr>
<td>BuyMidCap</td>
<td>113</td>
<td>-.021252</td>
<td>.2173715</td>
<td>.0204486</td>
</tr>
<tr>
<td>BuySmallCap</td>
<td>104</td>
<td>-.082727</td>
<td>.2782095</td>
<td>.0272807</td>
</tr>
</tbody>
</table>

**Table 28. One-Sample Statistics, Buy Recommendations**

**Source:** Made by Authors in SPSS
The significance of the abnormal RARAR of the Buy Recommendations varied. The abnormal RARAR of the Large Cap buy recommendations was significant with a significance level of 0.977. Also the abnormal RARAR of the Mid Cap segment was significant with a significance level of 0.3 clearly above the critical value at 0.05. However the abnormal RARAR of the Total and the Small Cap segments both lack significance, with significance levels of 0.012 and 0.003 these abnormal RARAR cannot be regarded as significant as they significance level is below the critical value of 0.05. This implies that the means of these segments are significantly different from 0.

### 5.3.3. t-Test: Sell Recommendations

The significance of the abnormal RARAR of the Sell Recommendations varied. The abnormal RARAR of the Large Cap sell recommendations was significant with a significance level of 0.461756. Also the abnormal RARAR of the Mid Cap segment was significant with a significance level of 0.094959. However the abnormal RARAR of the Total and the Small Cap segments both lack significance, with significance levels of 0.255141 and 0.518925 these abnormal RARAR cannot be regarded as significant as they significance level is below the critical value of 0.05. This implies that the means of these segments are significantly different from 0.
Table 31. One-Sample t-Test, Sell Recommendations

Source: Made by Authors in SPSS

The tests results of the Sell recommendations largely resemble the Buy recommendations. First of all for the abnormal RARAR of the Total segment lacks significance. This is also true for the abnormal RARAR of the Small Cap sell recommendations which lack significance, the abnormal RARAR of both these segments have a significance level below the required 0.05. The abnormal RARAR of the Large and Mid Cap segments on the other hand stand significant at 0.617 and 0.218 respectively well above the required 0.05. It is also important to note that the number of sell recommendations for the Large Cap and Mid Cap is below 30, which means that the CLT does not apply and therefore the parametric test is inappropriate for these two groups.

5.4. Non Parametric test: Wilcoxon test

As mentioned earlier, to be as thorough as possible in our hypotheses testing we conducted both parametric and non-parametric tests to complement each other. The one sample Wilcoxon test was used with a 0.05 critical value, which is free from distributional assumptions and compares the test value to the median instead of the mean. These Wilcoxon tests have been segmented and divided in the same fashion as the t-Tests were and as will be displayed, yielded matching outcomes to the t-Tests.

5.4.1. Wilcoxon test: Total Recommendations

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Test</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median of Total = 0</td>
<td>One sample Wilcoxon Signed Rank Test</td>
<td>0.491</td>
<td>Retain the null hypothesis.</td>
</tr>
<tr>
<td>Median of Large Cap = 0</td>
<td>One sample Wilcoxon Signed Rank Test</td>
<td>0.574</td>
<td>Retain the null hypothesis.</td>
</tr>
<tr>
<td>Median of Mid Cap = 0</td>
<td>One sample Wilcoxon Signed Rank Test</td>
<td>0.550</td>
<td>Retain the null hypothesis.</td>
</tr>
<tr>
<td>Median of Small Cap = 0</td>
<td>One sample Wilcoxon Signed Rank Test</td>
<td>0.953</td>
<td>Retain the null hypothesis.</td>
</tr>
</tbody>
</table>

Table 32. Wilcoxon test, Total

Source: Made by Authors

Just like the t-Tests the Wilcoxon test for the Total segment all yield statistical significance of the median abnormal RARAR relating to the test value. The Small Cap recommendations median abnormal RARAR have a 0.953 significance level and the Total, Large Cap and Mid Cap segments’ median abnormal RARAR is in the range between 0.49-0.57 significance level.
### 5.4.2. Wilcoxon test: Buy Recommendations

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Test</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median of Buy Total = 0</td>
<td>One sample Wilcoxon</td>
<td>0,010</td>
<td>Reject the null hypothesis.</td>
</tr>
<tr>
<td>Median of Buy Large Cap = 0</td>
<td>One sample Wilcoxon</td>
<td>0,590</td>
<td>Retain the null hypothesis.</td>
</tr>
<tr>
<td>Median of Buy Mid Cap = 0</td>
<td>One sample Wilcoxon</td>
<td>0,350</td>
<td>Retain the null hypothesis.</td>
</tr>
<tr>
<td>Median of Buy Small Cap = 0</td>
<td>One sample Wilcoxon</td>
<td>0,003</td>
<td>Reject the null hypothesis.</td>
</tr>
</tbody>
</table>

**Table 33. Wilcoxon test, Buy**

**Source:** Made by Authors

The Wilcoxon test result varied in the Buy segment, just as with the t-Tests. The Large Cap and Mid Cap segments’ median abnormal RARAR proved statistically significant, both above the required 0.05. Meanwhile the Total and Small Cap segments’ median abnormal RARAR showed to be insignificant, both below 0.05 in significance level.

### 5.4.3. Wilcoxon test: Sell Recommendations

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Test</th>
<th>Sig.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median of Sell Total = 0</td>
<td>One sample Wilcoxon</td>
<td>0,000</td>
<td>Reject the null hypothesis.</td>
</tr>
<tr>
<td>Median of Sell Large Cap = 0</td>
<td>One sample Wilcoxon</td>
<td>0,836</td>
<td>Retain the null hypothesis.</td>
</tr>
<tr>
<td>Median of Sell Mid Cap = 0</td>
<td>One sample Wilcoxon</td>
<td>0,225</td>
<td>Retain the null hypothesis.</td>
</tr>
</tbody>
</table>
In the Sell segment we note the same results for the Wilcoxon test and the t-Test as the Large Cap sell recommendations and Mid Cap sell recommendations prove significant. Meanwhile the Total and Small Cap prove insignificant as seen earlier as well.

5.5. Pearson’s Correlation

Using Pearson’s Correlation we have tested our data for possible relationships. Specifically we have tested for a statistically significant correlation first between the trend of the stock prior to its recommendation and the realized abnormal risk adjusted return and second between a recommended stock’s Beta and the realized abnormal risk adjusted return.

5.6. Correlation: Trend & Return

First out the results of the correlation between trend and return will be presented. It is segmented as earlier with the Total recommendations, and then divided into Large Cap, Mid Cap and Small Cap. A scatter plot for each segment of the recommendations will also be presented to further aid the analysis.

In the figures we have plotted the return of the trend against the return of the segment of recommendations. The return of the trend is as mentioned the recommended stocks’ performance over the three months prior to the stocks’ recommendation being published. The return of the segment of recommendations’ is the return of the recommendations during the investment horizon.

5.6.1. Correlation Trend: Total

<table>
<thead>
<tr>
<th></th>
<th>ReturnTotal</th>
<th>TrendTotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.109*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.023</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>439</td>
<td>439</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.109*</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.023</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>439</td>
<td>439</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).

Table 35. Correlation for Trend Total

Source: Made by Authors in SPSS
For the Total segment, we find a statistically significant relationship as the significance level of 0.023 is below 0.05 critical value. Even though the recommendations seem widely scattered there is a weak correlation of -0.109. Which means that the variables in relation to each other move in opposing directions.

**Figure 12.** Trend for all recommendations

**Source:** Made by Authors in SPSS
5.6.2. Correlation Trend: Large Cap

<table>
<thead>
<tr>
<th>ReturnLarge</th>
<th>TrendLarge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.008</td>
</tr>
<tr>
<td>N</td>
<td>186</td>
</tr>
<tr>
<td>TrendLarge</td>
<td>Pearson Correlation</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.008</td>
</tr>
<tr>
<td>N</td>
<td>186</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Table 36. Correlation for Trend Large Cap
Source: Made by Authors in SPSS

Figure 13. Trend for Large cap recommendations
Source: Made by Authors in SPSS

For the Large Cap segment the Pearson’s correlation point to a significant correlation of -0.194 between the Return of the recommendation and the Trend of the recommendation. The correlation indicates that there is a relationship saying that the more negative the trend has been the more positive return the recommendation will
result in. Vice versa also applies as the more positive the trend, the worse the realized return will be.

5.6.3. Correlation Trend: Mid Cap

<table>
<thead>
<tr>
<th></th>
<th>ReturnMid</th>
<th>TrendMid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.200*</td>
</tr>
<tr>
<td>ReturnMid Sig. (2-tailed)</td>
<td></td>
<td>.030</td>
</tr>
<tr>
<td>N</td>
<td>118</td>
<td>118</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.200*</td>
<td>1</td>
</tr>
<tr>
<td>TrendMid Sig. (2-tailed)</td>
<td>.030</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>118</td>
<td>118</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).

Table 37. Correlation for Trend Mid Cap

Source: Made by Authors in SPSS

Figure 14. Trend for Mid Cap recommendations

Source: Made by Authors in SPSS
The Mid Cap segment also exhibits a statistically significant correlation of -0.2. As can be seen both visually on the scatter plot and by comparing the correlation coefficients (-0.2 vs -0.194) the correlation of the Mid Cap and the Large Cap is almost identical.

5.6.4. Correlation Trend: Small Cap

<table>
<thead>
<tr>
<th></th>
<th>ReturnSmall</th>
<th>TrendSmall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0.013</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.882</td>
</tr>
<tr>
<td>N</td>
<td>135</td>
<td>135</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>-0.013</td>
<td>0.882</td>
</tr>
<tr>
<td>N</td>
<td>135</td>
<td>135</td>
</tr>
</tbody>
</table>

Table 38. Correlation for Trend Small Cap

Source: Made by Authors in SPSS

Figure 15. Trend for Small Cap recommendations
Source: Made by Authors in SPSS
In the Small Cap segment, no relationship is recognizable and neither does the correlation indicate that a significant relationship between the variables would exist.

Overall, three out of the four segments, the Total, Large and Mid Cap, displayed a statistically significant correlation between trend and return. Interestingly the trend identified is extremely similar between two of the segments, both in terms of the direction which was negative and the strength which was ca. 0,2. This correlation implies that the more negative the trend has been the more positive the recommendation’s return will be and vice versa. Meanwhile the Small Cap segment displayed no significant correlation whatsoever.

5.7. Correlation: Beta & Return

To present the results of the correlation between the Beta of the recommended stock and the abnormal realized average risk adjusted return of the recommendation, the same segmentation and division as earlier is used.

5.7.1. Correlation Beta: Total

<table>
<thead>
<tr>
<th></th>
<th>ReturnTotal</th>
<th>BetaTotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0,070</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0,145</td>
</tr>
<tr>
<td>N</td>
<td>440</td>
<td>440</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-0,070</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0,145</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>440</td>
<td>440</td>
</tr>
</tbody>
</table>

*Table 39. Correlation for Beta Total*

*Source: Made by Authors in SPSS*
Figure 16. Correlation between Beta and return, all recommendations

Source: Made by Authors in SPSS

For the Total recommendation segment there is no statistically significant correlation. Instead the scatter plot of the Total recommendations show that these observations are greatly dispersed.

5.7.2. Correlation Beta: Large Cap

<table>
<thead>
<tr>
<th></th>
<th>ReturnLarge</th>
<th>BetaLarge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0.025</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.733</td>
</tr>
<tr>
<td>N</td>
<td>186</td>
<td>186</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-0.025</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.733</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>186</td>
<td>186</td>
</tr>
</tbody>
</table>

Table 40. Correlation for Beta Large Cap

Source: Made by Authors in SPSS
The Large Cap also lacks a significant relationship between the Return and the Beta. Although a horizontal concentration around 0 is evident the sample still lacks correlation.

### 5.7.3. Correlation Beta: Mid Cap

<table>
<thead>
<tr>
<th></th>
<th>ReturnMid</th>
<th>BetaMid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0.168</td>
</tr>
<tr>
<td>ReturnMid Sig. (2-tailed)</td>
<td></td>
<td>0.069</td>
</tr>
<tr>
<td>N</td>
<td>118</td>
<td>118</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td>-0.168</td>
</tr>
<tr>
<td>BetaMid Sig. (2-tailed)</td>
<td></td>
<td>0.069</td>
</tr>
<tr>
<td>N</td>
<td>118</td>
<td>118</td>
</tr>
</tbody>
</table>

**Table 41. Correlation for Beta Mid Cap**

**Source:** Made by Authors in SPSS
Regarding the Mid Cap segment, a statistically significant trend cannot be accepted with 5% confidence. Although this segment is fairly close as the test statistic of 0.069 is only barely above the required 0.05 critical level. This segment is the closest to a correlation between the return of the recommendation and the Beta of the recommendation. If this correlation was to hold then it would mean that higher beta values lead to lower realized returns.

5.7.4. Correlation Beta: Small Cap

![Graph showing correlation between Beta and return for Mid Cap recommendations]

**Figure 18.** Correlation between Beta and return, Mid Cap recommendations

**Source:** Made by Authors in SPSS

<table>
<thead>
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<th>ReturnSmall</th>
<th>BetaSmall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
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<td>-0.048</td>
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<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.581</td>
</tr>
<tr>
<td>N</td>
<td>136</td>
<td>136</td>
</tr>
<tr>
<td>Pearson Correlation</td>
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</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.581</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>136</td>
<td>136</td>
</tr>
</tbody>
</table>

**Table 42.** Correlation for Beta Small Cap

**Source:** Made by Authors in SPSS
Figure 19. Correlation between Beta and return, Small Cap recommendations  
**Source:** Made by Authors in SPSS

This Small Cap segment also lacks a significant correlation and exhibit a seemingly completely random distribution across the scatter plot.

To conclude this section regarding possibilities of correlation between return and beta it is apparent that no relationship between these two variables was found. The closest call was that of the Mid Cap segment, however the significance level is not above the critical value and can therefore not be deemed statistically significant.
Chapter 6: Discussion

The research question along with the sub-research questions will be answered in this chapter. The hypotheses will first be accepted or rejected and then discussed along with the sub-research question. The hypotheses have all been developed from the main research question and the sub-research questions outlined earlier.

6.1. Research question & Hypothesis 1: Rationality

Research question:

Are individual investors rational by following analysts’ recommendations for Swedish stocks? The Case of Placera.

Sub research question:

Will Placera’s analysts beat the market index?

Hypothesis:

There is no difference between the realized average risk adjusted return when following analyst recommendations and the market index.

\[ H_0: \text{RARAR} - \text{Index Return} = 0 \]

\[ H_1: \text{RARAR} - \text{Index Return} \neq 0 \]

If \( H_1 \) is accepted then:

\[ \text{RARAR} - \text{Index Return} < 0 \text{ or } \text{RARAR} - \text{Index Return} > 0 \]

We cannot reject the null hypothesis as the t-statistic > 0.05. Both for the t-test and the Wilcoxon test, there is no statistically significant difference in return between following recommendations and following an index.

-Is it Rational?

From our empirical research the first conclusive result was that the analysts’ recommendations did not beat the market index, there was no statistically significant difference. For the recommendations to be profitable they would also need to compensate the mimicking investor for several other factors not included in the return difference. This includes time consumption, transaction costs and broker fees. But also issues such as the discrepancy between the price at the time the recommendation is published versus the price when the investor actually trails the recommendation. These aspects further highlight the unprofitability of the analysts’ recommendations, especially versus index funds which are free from management fees and transaction costs, for example the index fund Avanza Zero. With this reasoning it becomes evident that following recommendations is a disadvantageous alternative in comparison with indexing.
Compared to the other large study done on recommendations in Sweden by Lidén and Rossander (2006) our results are very similar. Our data’s mean is not significantly different from 0 as we have seen and this other study for the 12 month timespan saw the result of -0.10% which is also approximately 0. As well in their time horizon and sample it was a very close race between the benchmark and the performance of the recommendations.

Recapping its meaning, rationality would infer that if an investor acts rationally he or she will select the most advantageous alternative given their own preferences (Vriend, 1995, p.268-269). A rational investor would strive to maximize profits and minimize time consumed and thereby would never choose to consistently follow all of Placera’s recommendations. Hence it is not rational to follow these recommendations as they serve as an inferior alternative to following an index. Investors which do follow the recommendations are not rational as they select the less advantageous investment option. As individual investors have less experience, knowledge and education compared to professional institutional investors, the investor may often be completely unaware or ignorant of how their behavior is not rational. Therefore they can greatly benefit from being exposed to research such as our own.

Research in rationality strengthens this conclusion as it has shown that investors profit the most by being rational and pursuing a passive strategy where they buy and hold the index. However investors tend to do quite different things, restating the earlier quote: “Investors follow the advice of financial gurus, fail to diversify, actively trade stocks and churn their portfolios, sell winning stocks and hold on to losing stocks thereby increasing their tax liabilities, buy and sell actively and expensively managed mutual funds, follow stock price patterns and other popular models.” (Shleifer, 2000, p.10). Investors following financial analysts are right in there with these examples of irrational investors who stray away from the more profitable passive strategies.

Another aspect of this issue is the analysts themselves. If they cannot consistently beat the market then they are not performing their job well. For it to be justified to employ people specializing in recommending individual stocks they need to be able to continuously provide an excess return over the market index. As these employees consume time, resources and require compensation which a market index does not. Many factors indicate that at least some of the analysts suffer from overconfidence. Given the realized performance of Placera’s analysts the concept of overconfidence portrays them well. The first of the characteristics presented in the theoretical framework based on Odean’s (1998) research, was that a selection bias is prominent in very difficult jobs. This is because the people with the highest skills and the people with the most overconfidence in their skills are the ones most likely to pursue these types of challenging positions. Second, overconfidence leads investors to pursue active strategies before passive strategies and indexing. Third, when pursuing these active strategies the overconfident investor is seen to trade too frequently. Fourth, compared to novices experts can be even more susceptible to overconfidence as they are inclined to overweight the theories and models which they use. This issue is even more prominent in situations when predictability is very low, which is the case in the stock market. Fifth, it is very usual that success leads to overconfidence of people, people who become experts have often been successful but these same people tend to overweight their own contribution to this success. Sixth and lastly, overconfident investors tend to hold undiversified portfolios.
These six characteristics of overconfident investors all fit in well with the behavior of analysts: Analysts hold extremely difficult jobs as they through very active strategies of picking individual stock picking attempt to beat the market. With almost 450 stock recommendations published in just 21 months these analysts have also upheld a very high trading frequency over this period. Furthermore these analysts are experts which likely often use sophisticated models and theories and then also overweight the power of these, which is even more likely in the stock market as predictability is low, experts need models and theories to try to assist them. Also, analysts need to have been successful in the past to be where they are today and will then overweight their contribution to this success. Finally, Placera’s analysts pick individual stocks without considering portfolio building and diversification which is another display of overconfidence.

With so many connections between overconfident behavior and the analysts’ behavior it would be wise for Placera’s analysts to evaluate themselves and gain better self-insight as overconfidence may be a very severe issue which diminishes their performance. An example is that it could be advisable to make recommendations form a portfolio, this would give the analysts several benefits such as diversification, risk management, possibilities to pick stocks that complement each other, making it easier to track and follow overall performance and hopefully also decrease the amount of excessive trading. The investors following the analysts would see all these benefits as well, along with teaching them about portfolio building, portfolio management and money management. These investors can then learn from this and ultimately become independent.

Herding is another concept that may attribute explanation to the lack of profits that the analysts’ recommendations realized. In the event of herding, the later on is to join the herd the worse off one’s investment will turn out. Presented in the theoretical framework analysts are more likely to herd in a bullish market seeing as the stock market over our covered period has had a positive return of ca. 10% a rather bullish market has been seen. If Placera’s analysts then have herded it may definitively account to their poor performance as they have not been early enough with their investments to be profitable. Due to the herding effect analysts also bear a great responsibility as they create or further a herd with their recommendations they contribute to the buildup of bubbles. Analysts need to remain rational, responsible and value firms for their fundamentals and not follow herd and contribute to them with their followers. (Hirshleifer & Teoh, 2001, p. 28-29).

Behavior such as irrationality of investors and overconfidence of analysts will also make an impact on the market. First of all, the efficient market hypothesis is subject to a very important assumption which is that all market participants are rational (Fama, 1995, p.76). However as we have now shown when investors often act very irrationally it greatly impedes market efficiency. If investors are not fully rational then they are not capable at logically valuing all available information and pricing it into the market price of a stock. This will in turn lead to deviations between the market price and the true value of the firm which means that the market is not fully efficient and opens for the opportunities for clever investors to consistently make abnormal profits beating the market. Second, the overconfidence of analysts and through them the mimicking investors as well, will also impact market efficiency. Since overconfidence will lead to
miss-valuations which will lead to systematically positive and negative serially correlated returns, which eradicates the random walk (Odean, 1998, p.1916). As random walk is the foundation of the theory of efficient markets, market efficiency certainly realizes some impairments due to the overconfidence of market participants.

6.2. Sub-Research Question & Hypothesis 2: Size

Sub-research question:

Within which firms size category will Placera’s analysts perform the best?

Hypothesis:

There is no difference between the return that the analysts realize depending on different firm sizes.

Large Cap:

H₀: Large Cap RARAR – Index Return = 0
H₁: Large Cap RARAR – Index Return ≠ 0
If H₁ is accepted then:

Large Cap RARAR – Index Return < 0 or
Large Cap RARAR – Index Return > 0

Mid Cap:

H₀: Mid Cap RARAR – Index Return = 0
H₁: Mid Cap RARAR – Index Return ≠ 0
If H₁ is accepted then:

Mid Cap RARAR – Index Return < 0 or
Mid Cap RARAR – Index Return > 0

Small Cap:

H₀: Small Cap RARAR – Index Return = 0
H₁: Small Cap RARAR – Index Return ≠ 0
If H₁ is accepted then:

Small Cap RARAR – Index Return < 0 or
Small Cap RARAR – Index Return > 0

The outcome, both for the t-Test and the Wilcoxon test, was as follows:

Large Cap test statistic > 0,05
Small Cap test statistic > 0,05
Mid Cap test statistic > 0,05

We cannot reject the null hypothesis, that the difference in abnormal RARAR when following Large, Mid or Small Cap recommendations is statistically significantly different from 0. Neither of the size segments produce a difference in abnormal RARAR that is significantly different from 0, thus there is no difference in the abnormal RARAR that analysts realize depending on the firm size.

During our time horizon we saw the following abnormal RARAR performed by the recommendations:
Large cap: -0.43% abnormal RARAR
Mid cap: -1.36% abnormal RARAR
Small cap: 3.28% abnormal RARAR

Most notably the Small Cap saw a large abnormal RARAR of 3.28% and was the only market size which was profitable. The Large Cap was slightly negative at -0.43% and the most negative was the Mid Cap at -1.36%.

**Is Smaller Better?**

This investigation was to see if there is a difference between the analysts’ abnormal RARAR depending on the size of the recommended stock. The outcome of our study was that no such difference is statistically viable. This means that Placera’s analysts’ performance is approximately equal over the three cap segments and that they are not more or less skillful with their recommendations depending on the size of the firm.

Several previous studies for example those by Banz (1981) and Bauman et al. (1998) displayed results where the recommendations on smaller stocks outperformed recommendations on large stocks. This was the reason for why we insisted on testing for this phenomenon on our sample as well. This phenomenon has been seen as reoccurring however it is not identified in our data. However we do see that over our covered time horizon the Small Cap stocks realized a notable abnormal RARAR of 3.28%, substantially greater than the Large and Mid Cap which both saw a negative abnormal RARAR. Thereby a touch of this small size phenomenon is prominent during our time period as well. Although a clear relationship of recommendations on smaller stocks performing better than those on larger is not at all evident as the Mid Cap stocks are outperformed by the Large Cap.

Our research cannot support the commonly seen anomaly of Small Cap stock recommendations performing better than the Mid and Large Cap yet neither does it contradict it. Especially seeing how the Small Cap recommendations actually did outperform the others in terms of the abnormal RARAR over our covered period. We saw the Large Cap recommendations having the abnormal RARAR close to 0 at -0.43% and the Small Cap recommendations was the furthest from 0 at 3.28%. This very small difference from the index that the Large Cap return resulted in can perhaps be attributed to the competition for returns in the stocks. The Large Cap stocks are the mostly heavily monitored, followed, traded, widely known and often most transparent thereby the competition for returns is the most fierce. This heavy competition leads to that the market price of such stocks becomes extremely accurate estimations of the actual intrinsic value of the firm. Meanwhile the Small Cap segment saw the largest deviation from 0 and thus the largest discrepancy from the average return of the market. This can then perhaps be attributed to the opposite factors as Small Cap stocks are less monitored, traded etc. This lesser amount of competition will then allow for more situations where the smaller stocks experience large miss-valuations where the going market price deviates significantly from the intrinsic value of the firm which allows for more opportunities to profit. All this relates back to market efficiency as the difference in competition leads to differences in how efficient the market is when pricing the stock in question. If Large Cap stocks see more intense competition, the market will be more efficient as abnormal RARAR are quickly eliminated and the market price will rarely stray from the intrinsic value. Meanwhile if competition is less fierce for Small Cap
stocks then the market will be less efficient making market price deviations from true value more numerous and large.

### 6.3. Sub-Research Question & Hypothesis 3: Buy vs. Sell

Sub-research question:

*Will Placera’s analysts perform best in terms of buy or sell recommendations?*

Hypothesis:

There is no difference between the return that the analysts realize depending on whether the recommendation is to buy or to sell.

**Buy Recommendations:**

- **H₀:** Buy RARAR – Index Return = 0
- **H₁:** Buy RARAR – Index Return ≠ 0

  If H₁ is accepted then:

  - Buy RARAR – Index Return < 0 or
  - Buy RARAR – Index Return > 0

**Sell Recommendations:**

- **H₀:** Sell RARAR – Index Return = 0
- **H₁:** Sell RARAR – Index Return ≠ 0

  If H₁ is accepted then:

  - Sell RARAR – Index Return < 0 or
  - Sell RARAR – Index Return > 0

The outcome, which was identical using the t-Test and Wilcoxon test, of these two tests was as follows:

- **Total Buy recommendations:** reject the null hypothesis because the t-statistic < 0.05. Consequently there is a significant difference between the return of the index and the buy recommendations. This average return is negative, as the recommendations are outperformed by the index with -2.9%.

- **Total Sell recommendations:** reject null hypothesis because the t-statistic < 0.05. Consequently there is a significant difference between the return of the index and the sell recommendations. This average return is positive, as the recommendations outperform the index with 16.2%.

- **Are You Better of Selling?**

Through this study we found compelling results that there is a statistically significant difference between the abnormal RARAR that the analysts realize depending on if there recommendation is a buy or a sell. The study produced statistically significant results that the sell recommendations published by Placera are by far (16.2% versus -2.9%) more profitable than their buy recommendations.
The extension of this in terms of investors’ rationality is that even though following all of Placera’s recommendations is irrational, following only Placera’s sell recommendations is completely rational. Placera’s sell recommendations generate an abnormal RARAR over the index definitely large enough to cover transaction costs and also to be very profitable factoring in the time spent when following. Thus with the alternatives of following Placera’s sell recommendations and the market index, following Placera’s sell recommendations is the rational choice.

Looking back at the previous research presented for example in Balboa et al.’s research and in Lidén and Rossander’s as well, sell recommendations outperforming buy recommendations has been seen to be a reoccurring phenomenon. Our research now provides another strong count to the occurrence of this phenomenon. This phenomenon is extremely prominent and consistently reoccurring, perhaps even so much so that this is not even an anomaly; sell outperforming buy may in fact be the regular reality. If this is the case then it is important that analysts and investors take this into serious consideration. First the analysts need to review their process of valuing stocks and making recommendations as something is certainly going much better when reaching the conclusion that a stock is overvalued compared to when they deem a cheap and undervalued. The analysts need to learn from this and attempt to rectify whatever is missing or erroneous in their process making buy recommendations. The investors can also take away a lot from these results, the obvious approach is that they could follow only the sell recommendations, or at least allocate more money to sell recommended stocks, and ignore the buy recommendations and invest excess liquidity in an index instead. One issue however is that the common individual investor does not always have the possibility of short selling as this is not a standard form of conventional investment. Often an application is needed, adequate credit value and liquid reserves available since short selling can cause the short seller to be liable of an amount greater than the invested amount. Even so, with a little determination most individual investors will be able to short sell stocks.

There are several possible explanations to why the analysts have performed so much better with their sell recommendations. First of all the psychology of the analyst is a factor, as it is more controversial to recommend your followers to sell than to buy. As an analyst you are then sticking out your neck significantly and before you do so, naturally you will demand of yourself that you are more certain about your valuation and thus your recommendation. Furthermore one could argue that when things begin to go wrong in a firm it is very hard to right a sinking ship compared to how easy it is to become sloppy and inefficient when things are going well. If the issue lies in the business model, the market conditions, the core competence, the company structure or similar it will be very difficult and extremely costly to reinvent the company. Then there is only one place a struggling stock listed company generates such amounts of new funds from that is issuing new stocks, which would further decrease the stock price. Thereby when a stock begins to fall it will easily continue while a rising stock must fight to stay on that ascent. Also, the obstacle of obtaining the right to short sell makes the competition for returns by short selling stocks less significant, as fewer have this possibility, which gives rise to more profitable opportunities.

We have seen as well that sell recommendations are published in a much lower quantity as they counted for only 12% of the sample. This invites for the notion of quality over quantity perhaps applying to the sell recommendations. Even more interestingly the
lower quantity and better performance of the sell recommendation indicates that the analysts are less overconfident concerning their abilities of recommending investors to sell. Meanwhile the buy recommendations have been published in much more numerous amounts, which indicates a higher overconfidence. Thereby overconfidence may also help to explain the difference in performance seen.

### 6.4. Sub-Research Question & Hypothesis 4: Anchoring

**Sub-research question:**

Is it rational to base the decision to follow a recommendation by anchoring on the recent trend of the stock?

**Hypothesis:**

There is no correlation between the trend of a stock prior to the recommendation and the performance of the recommendation.

H\textsubscript{0}: Correlation = 0  
H\textsubscript{1}: Correlation ≠ 0

These tests were segmented and then individually tested using Pearson’s correlation, the results were as follows:

Total recommendations: Reject null hypothesis because the t-statistic < 0.05. Thus there exists a statistically significant correlation between the trend of the recommendations and the performance of the recommendations.

Large cap: Reject null hypothesis because the t-statistic < 0.05. Thus there exists a statistically significant correlation between the trend of the Large Cap recommendations and the performance of the recommendations.

Mid cap: Reject null hypothesis because the t-statistic < 0.05. Thus there exists a statistically significant correlation between the trend of the Mid Cap recommendations and the performance of the recommendations.

Small cap: Retain the null hypothesis because the t-statistic > 0.05. In this case there does not exist a statistically significant correlation.

**Does Trend Matter?**

With these results we identify that there exists a correlation between these two variables trend and realized return, at least for three out of the four tested segments. For the total, the large cap and the mid cap we found a significant correlation which indicates that the more positive the trend is prior to the recommendation the poorer the realized return will turn out. The implications of this are that investors should consider the trend of the stock before following a particular recommendation. This would be a type of anchoring technique where the investor anchors based on the trend. Which is fully rational based on the results found if the investor follow buy recommendations which have seen negative trends (leads to positive returns) and sell recommendations which have seen positive trend (leads to negative returns).

Remarkably no statistically significant correlation was found for the small cap segment. As this study is new and unique according to our pre-research and knowledge no previous studies can be related back to and used for comparison. What we do know
from previous research within anchoring is that investors tend to anchor their investment decisions based on attention draws. Analysts’ recommendations and past stock price performance are both significant attention draws for an investor. Our research specifies that this anchoring behavior is rational in certain situations. It is rational to anchor based on trend if the trend is negative and the recommendation is to buy and if the trend is positive and the recommendation is to sell. Seen earlier on in this discussion is that investors also behave rationally if they anchor the decision to short sell based on that the analyst has recommended to sell that stock. (Odean, 1999, p.24-25)

6.5. Sub-Research Question & Hypothesis 5: Risk

Sub-research question:

*Does the recommended stock’s risk level affect Placera’s analysts’ performance?*

Hypothesis:

There is no correlation between the beta of a recommended stock and the performance of the recommendation.

\[ H_0: \text{Correlation} = 0 \quad H_1: \text{Correlation} \neq 0 \]

These tests were also segmented and then individually tested using Pearson’s correlation, the results were as follows:
Total recommendations, Large Cap, Mid Cap and Small Cap: Retain the null hypothesis because the t-statistic > 0.05. In all cases there does not exist a statistically significant correlation.

-What about the Beta?

The results from this test were quite consistent as for all segments the null hypothesis has been retained. Thereby with this knowledge we see that the two variables, beta and the performance of the recommendation (the RARAR), are not associated with each other. This means that the performance of the recommendation does not in any way depend on the beta which is the stock’s sensitivity to price changes in the market index. Consequently it does not matter if the investor follows a recommendation of a stock with a high or a low beta. This test was done to see if the analysts would perform differently based on the recommended stock’s sensitivity to price changes in the market index. As it turns out this lack of relationship indicates that the beta is not a factor which investors need to take into account when considering an investment decision as the analysts’ performance does not vary systematically based upon the beta value.
Chapter 7: Conclusion

This final chapter will conclude our thesis. First we will start by summarizing the results of our research. This will be followed by an evaluation of the paper through our purpose, research gap and contribution. We close this chapter by suggesting further research subjects.

7.1. Research question

Are individual investors rational by following analysts’ recommendations for Swedish stocks?  
- The Case of Placera

Interlinked sub-research question:  
Will Placera’s analysts beat the market index?

-Answer

The answer to the research question and the interlinked sub-research question will now be clearly stated. The answer to the research question is simply no. Individual investors are not rational when following Placera’s analysts’ recommendations for Swedish stocks. The main reason for this is provided by the answer to the related sub-research question, which is also no, Placera’s analysts did not beat the market index. In other words the RARAR of Placera’s recommendations was not significantly greater than the return of the market index. This along with the fact that unlike indexing, following recommendations costs both time and money, which makes the market index the superior investment alternative and thereby the rational choice.

One tentative explanation for the poor performance of Placera’s analysts’ is that they are likely overconfident. This was displayed through how the typical characteristics of an overconfident investor fit in very well on the behavior of these analysts. This consists of how analysts’ face a selection bias, they pursuing active strategies before passive ones, have an inclination towards an excessive trade frequency, experts’ tendency to overweight theory and models, how success can lead to overconfidence and finally that overconfident investors tend to hold undiversified portfolios. As such it is probable that overconfidence among Placera’s analysts negatively affects their performance. Which is in issue for Placera to look into further for the sake of their performance and their followers.

Herding may also have been prevailing among Placera’s analysts. If this is so then this will also bring down Placera’s analysts’ performance because if you follow a herd the stock will already have moved with the initiators of the herd and the followers which acted earlier then you yourself did. Analysts need to consider that they bear a responsibility towards their followers, their firm and themselves and that herding can spiral into bubbles and subsequently crashes. Therefore analysts should stray away from herding and instead remain rational and recommended based on proper thorough valuations.
The final implications of this research question are that the irrationality and overconfidence of market participants decreases market efficiency. Irrational investors cause a vital assumption of the efficient market hypothesis to fail. Irrationality leads to the inability of investors to properly value stocks and price new information into a stock which in turn leads to deviations between the stock’s market price and its intrinsic value. Overconfidence of market participants also decreases market efficiency as it leads to incorrect valuations which in turn lead to systematically serially correlated returns. That means that stock prices will not wander completely randomly, however the efficient market hypothesis is built upon the notion of the random walk of stock price. An interesting implication of all of this is that if the markets are not fully efficient then there actually are opportunities for skillful investors to make long term abnormal profits.

7.2. Sub-research Questions

Within which firms size category will Placera’s analysts perform the best?

Placera’s analysts’ performance did not vary significantly based on the firm size of the recommended stocks. The answer to this question is therefore that there was no firm size category where Placera’s analysts performed the best, it was a draw between all three. This outcome is somewhat surprising as a consistently reoccurring anomaly has been identified in previous studies showing that recommendations on smaller stocks outperform recommendations on larger stocks. This anomaly is not supported by our research however the realized result over our covered period showed that the Small Cap stocks outperformed the Mid and Large Cap. This is an indication of the anomaly actually applying for our sample but not statistically viable evidence supporting it. A possible explanation for the anomaly is competition for returns. Which is that Large Cap stocks see heavier competition for possible abnormal returns as they are more intensely followed and traded compared to Small Cap stocks.

Will Placera’s analysts perform best in terms of buy or sell recommendations?

The outcome of our research shows with statistical significance that Placera’s analysts perform best in terms of sell recommendations. The difference in abnormal RARAR was approximately 20%, in favor of the sell recommendations. These results also mean that it actually is rational to follow Placera’s sell recommendations exclusively. Meanwhile the buy recommendations are not rational to follow due to their poor performance. This significant difference in return between the buy and sell recommendations make it necessary for Placera to review their process of making valuations and recommendations.

The result of our study is consistent with previous research which has shown in many cases that sell recommendations perform better than buy recommendation. Our research provides statistically significant evidence supporting this anomaly. The evidence gathering for this irregularity raises doubt as to whether it actually is an anomaly or if this actually is our regular reality.

Many explanations are possible as to why the sell recommendations so vastly outperform the buy recommendations. It might be related to the psyche of the analysts
as it can be seen as much more controversial to recommend sell compared to buy. This would cause the analysts to be more careful with recommending sell versus buy and thus require a greater degree of confidence and certainty with their valuation. Such a conclusion is supported by how few the sell recommendations are compared towards the buy recommendations. This also supports another conclusion which would further explain the superior performance of the sell recommendations, that the analysts are less, or perhaps not at all, overconfident regarding sell recommendations. Both the lower quantity of sell recommendations and their superior performance indicates that these are subject to less overconfidence then the buy recommendations.

*Is it rational to base the decision to follow a recommendation by anchoring on the recent trend of the stock?*

The answer to this question is yes, it is rational to anchor an investment decision based on the trend of a recommendation. This is because our study shows a statistically significant correlation between the two variables, trend and realized return. The relationship is slightly negative meaning that the more negative the trend is the more positive the realized return of the recommendation will turn out. Therefore to base the decision to follow a buy recommendation based on that the trend of the stock in question has been very negative is a rational choice. Vice versa will be true for a sell recommendation. This means that anchoring upon the trend of a recommended stock is rational.

*Does the recommended stock’s risk level affect Placera’s analysts’ performance?*

No, the risk level of a recommended stock does not affect Placera’s analysts’ performance. This conclusion was reached through correlation analysis between a recommended stock’s risk level (Beta) and its abnormal RARAR. For all segments, there was no significant correlation was found. Thus the two variables are unrelated which means that Placera’s analysts’ performance does not vary or depend upon the risk level of the stock. The implication of this is that investors do not need to take the recommended stock’s risk level into account when considering to follow a recommendation.

The following quote from the perhaps most successful investor of our time, summarizes many of our thoughts and results, therefore it will wrap up our paper:

"Most investors, both institutional and individual, will find that the best way to own common stocks (shares') is through an index fund that charges minimal fees. Those following this path are sure to beat the net results (after fees and expenses) of the great majority of investment professionals."

- Warren Buffett, Berkshire Hathaway Chairman’s letter, 1996.
7.3. Purpose

The purpose of our research was to investigate the rationality of investors when they follow Placera’s recommendations. To do that we would compare the total performance of the index and recommendations. Along with that, we aimed to segment our sample into four different investigations. These would look at recommendations and performance in terms of size, buy versus sell, trend and risk level. Using eventual findings we would then analyze and draw conclusions regarding investor and analyst behavior and assess possible implications on the theory of efficient markets. This section will evaluate whether our completed study fulfills its purpose.

First off, we have provided a clear and simple answer to the research question based on the outcomes on a large sample of recommendations compared to a market index. The four investigations specified were all studied through sub-research questions and related hypotheses. Researching these led to interesting findings and the sub-research questions were also answered individually. We have then applied the theories, concepts and previous research presented in the theoretical framework and reached several conclusions regarding the behavior and rationality of both investors and analysts. Finally we have also considered the implications which these conclusions about the concerned market participants have on the theory of efficient markets. With that, the stated purpose of our paper is definitely fulfilled.

7.4. Research Gap

First off of the knowledge gap we identified concerned how compilations of stock recommendations needed further segmentation. Segments based on size and buy or sell have been done but needed updating and renewed knowledge while trend and risk level would bring new and fresh perspectives into those areas. Furthermore, relating these segments to theories and concepts such as overconfidence, anchoring, herding etc. to analyze rationality, was another gap we had not seen filled. The other part consisted of evaluating the theory of efficient markets by looking at it from new angles and focusing on its assumptions.

This research gap was approached through the case of Placera which limits the extendibility of the research yet with the large sample and support from previous studies, some generalizability is still applicable. Through our segmentation we produced many interesting findings some which have brought more recent data and some which have brought completely new data. This has fulfilled our purposed research gap to the furthest extent which was possible for us, but of course the possibilities of other types of segments are almost endless and also very interesting. By applying relevant theories and concepts on our empirical outcomes we found many connections between the theories and the behavior we identified in the real world. Yet the dynamics of human behavior is so vast and unexplored that we have only been able to fulfill our tiny part of it. And finally, as plan we reviewed the efficient market hypothesis and its assumptions using these connections and our research results. To conclude, we fulfilled these research gaps to furthest magnitude possible given our limitations.
7.5. Contribution

In terms of theory our contributions center around the concepts which we have analyzed and matched with the empirical side of our study. This is the investigation of investor rationality and investor and analyst behavior using overconfidence, herding and anchoring. Within this we have added to the knowledge pool of the concepts perhaps most importantly to anchoring within which there is little research previously done.

Our research also contributes with its specificity since it is country and organization specific to Sweden and Placera and consequently absolutely unique in these two aspects. This paper also covers a very recent time period which provides new and updated data to this area.

This study will benefit Placera with a full performance summary of their recommendations. With the segmentations the possibilities for Placera to utilize the results go even further as they can thoroughly review themselves and compare their performance between the segments. They can then improve and reinvent themselves by evaluating their process of valuation and their strategies.

Investors will also be able to benefit from this study as it can give them a lot of insight into their own behavior and help them to avoid irrational decisions. Also they can use the results of the recommendations to sort and follow only recommendations which have proven to be profitable which would primarily be the sell recommendations.

7.6. Further Research

After conducting this research we see many interesting opportunities for further research. The stock markets are in constant change with new tools and products appearing every year. They change the conditions, possibilities and opportunities for investors. Thereby beside our following suggestions we propose repetition of similar studies in the future.

The first suggestion for further research is to increase the time horizon. This can confirm if our results holds over a longer period. It can also be of interest to see if a study with a time horizon containing a whole business cycle would yield the same results. This could help investors in the decision of timing their holdings of a portfolio.

Our second suggestion is to perform this research on stocks based on other exchanges and countries then the Swedish stock market. This could show if for example the size of the economy and number of actors on the market will affect the results. Also interesting would be studies based on collaborations with another or multiple analyst firms, brokerage firms and banks, instead of Placera. It can be of great interest to see if firms that release less recommendations perform better and also to evaluate which of the type of firms performs best.

Third would be to broaden the scope of the research from concentrating on individual investors to enveloping all market participants somehow affected by stock recommendations. By for example investigating if rationality, overconfidence etc. varies between the market participants, cultures and countries. Such research could also look at
how the magnitude of these concepts affect the efficiency of the markets. If irrationality and overconfidence for example is very prominent among many of the participants within a market it would be interesting to see how much this negatively affects market efficiency.

The fourth suggestion for future studies is to study stock recommendations through other segments then ours (size, buy vs. sell, trend and Beta) to find abnormal returns. Other examples of categories is industries, financial ratios (P/E, P/B, debt ratio, dividend yield), and technical analysis (formations, signals, indicators).

The fifth proposal is to do an more extensive and in-depth study of the anomalies that sell outperform buy and smaller sized companies outperform larger ones. By this study try to finally prove that these anomalies rather can be seen as the reality of the financial world.

Our last suggestion for further research would concern a qualitative study researching analysts and investors’ behavior through interviews or likewise. The purpose would then be to gain a deeper understanding of analyst and investor behavior. Through our research method, no dialog with the market participants was held and this would provide a completely different perspective to the current knowledge pool in this area.

For anyone interested, the excel document gathered and computed for this study, can be obtained easily through contacting: erikandersson_@hotmail.com.
Reference list


