Behavioral Finance

The Student Investor

Paper within finance
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Background: History is full of examples on how humans can create investment bubbles through speculation; from the Dutch tulip mania to the Dot Com bubble humans have proven to be capable of creating economical chaos. Classical economical theories hold the assumption that individuals act rationally regarding decisions of an economical nature. Since the information on the stock market is available to everyone who seeks it, the appearance of investment bubbles should not be possible. Behavioral finance is an academic branch which seeks to explore these phenomena through the psychological factors affecting humans in investment decisions.

Purpose: The purpose of the report is twofold. Firstly it is to examine the characteristics of investment interested business students enrolled at Jönköping International Business School. Secondly it looks into the decision-making process and choices of the population from the perspective of behavioral finance.

Method: This research holds an abductive approach and is based on qualitative data. Data collection was done through an Internet-based questionnaire containing several different questions on the areas related to the inquiries. In some cases statistical analysis was conducted to test for significant correlation between key characteristics.

Results: A statistically proven correlation could be discerned between trading experience and frequency; for each additional year an individual engaged in trading the frequency increased. Herd behavior was detected in a majority of the sample. When faced with a scenario in which their immediate surrounding opposed their own analysis of a stock, the greater part of the sample would reconsider their position. Two main sub-groups were detected. The first was characterized by its high tolerance of risk; the second sub-group was characterized by its inconsistency in behavior.

Conclusions: This paper found that the behavior of respondents in the chosen population was best described as “student behavior”; a somehow irrational behavior explained by the learning process in which business students exist.
# Table of Contents

1 **Introduction** .................................................................................................................. 1  
  1.1 Background .................................................................................................................... 1  
  1.2 Problem ....................................................................................................................... 2  
  1.3 Purpose .......................................................................................................................... 3  
  1.4 Delimitations .................................................................................................................. 3  

2 **Research design** ............................................................................................................ 4  
  2.1 Research philosophy ..................................................................................................... 4  
  2.2 Research approach ....................................................................................................... 4  
  2.3 Data collection .............................................................................................................. 5  
    2.3.1 Primary data ............................................................................................................ 5  
    2.3.2 Secondary data ......................................................................................................... 6  

3 **Theoretical framework** .................................................................................................. 8  
  3.1 Fundamental analysis .................................................................................................... 8  
  3.2 Technical analysis ......................................................................................................... 8  
  3.3 Shefrins three themes .................................................................................................. 8  
    3.3.1 Heuristics ............................................................................................................... 9  
    3.3.2 Frame dependence .................................................................................................. 10  
    3.3.3 Inefficient markets ................................................................................................. 11  
  3.4 The Efficient Market Hypothesis .................................................................................. 11  
  3.5 Herd Behavior ............................................................................................................. 13  
  3.6 Risk in relation to return and return ............................................................................ 15  
  3.7 Previous studies .......................................................................................................... 15  

4 **Method** ........................................................................................................................ 18  
  4.1 Survey theory ................................................................................................................ 18  
    4.1.1 Designing the questions .......................................................................................... 18  
    4.1.2 Layout of the form .................................................................................................. 19  
    4.1.3 Explaining the purpose of the questionnaire .......................................................... 19  
    4.1.4 Pilot testing ............................................................................................................ 19  
    4.1.5 Planning and Execution ......................................................................................... 20  
  4.2 Survey Monkey ........................................................................................................... 20  
  4.3 The questionnaire ........................................................................................................ 20  
  4.4 Testing for correlation with non-parametric methods .................................................... 22  
  4.5 Attributes, Opinions and Behaviors .......................................................................... 22  

5 **Empirical findings and analysis** .................................................................................... 24  
  5.1 Empirical findings ........................................................................................................ 24  
  5.2 Analysis ........................................................................................................................ 31  
    5.2.1 Measuring Risk and Loss Aversion ....................................................................... 31  
    5.2.2 Measuring Trading Rationality and Analysis approach ....................................... 34  
    5.2.3 The connection between experience and frequency ............................................. 35  
    5.2.4 Herd behavior ....................................................................................................... 37  

6 **Conclusion** .................................................................................................................... 40  

7 **Reflections and further studies** .................................................................................... 41  

References ............................................................................................................................ 42
Appendices ................................................................................. 44
7.1 OMX Stockholm All share index development.......................... 44
7.2 Questions 3 and 4: Experience and Frequency.......................... 44
7.3 Questions 5a and 6: Spearman’s Rho................................. 44
7.4 Questions 5b and 3: Spearman’s Rho................................. 45
7.5 Frågeformulär .................................................................. 47
7.6 Questionnaire .................................................................. 50

Figures

Figure 1 - Gender ........................................................................ 24
Figure 2 – Age ........................................................................... 24
Figure 3 - Area of study ................................................................ 25
Figure 4 - Trading activity ......................................................... 25
Figure 5 - Trading experience ..................................................... 26
Figure 6 - Sources of information ............................................. 26
Figure 7 - Importance of area of activity .................................... 27
Figure 8 - Action during a stock market decline ......................... 27
Figure 9 - External influence ...................................................... 28
Figure 10 - Coin-flip situation .................................................... 28
Figure 11 - Portfolio management .............................................. 29
Figure 12 - Decision Tree 1: Risk and Loss Aversion ................. 33
Figure 13 - Decision tree 2: Herd Behavior ............................... 37
Figure 14 - Herd Behavior .......................................................... 38
Figure 15 - Follows through and listens to friends & family .......... 39
1 Introduction

From the Dutch tulip mania of the 1630’s, to the Great Depression in 1920’s and 30’s. Throughout modern history man has at times proven to be capable of creating investment bubbles. However the classic economical theories assume that humans are rational in their economical decision-making. If this assumption is true, would the existence of financial bubbles be possible? How does the private investor really function when faced with decisions of a financial character?

1.1 Background

In September 2002 the Stockholm stock exchange hit its bottom level in the aftermath of the financial crisis caused by the IT boom (Aronsson, 2004). During the years preceding the crash, stock prices had been rising as speculations kept pushing the prices upward. However the speculation was not limited to merely IT related stocks as the speculations on these stocks seemed to spread across the whole stock exchange, pressing index towards previously unknown heights. In the period between January 1, 1996 to January 1, 2000, index for all shares tripled going from 100SEK to 400SEK (Dagens Industri, 2008).

Observing the extent to which the stock market itself increased during this short period of time, one might have a hard time stating that the speculations on the Stockholm stock exchange was limited to purely IT related stocks. It would be equally difficult to state that the enormous increase in the price of shares was based more on economical fundamentals rather than pure speculations. While the OMX index for all shares grew 300% during this one year period, the GDP for Sweden as a whole grew only from about 1,829 million SEK, to 2,217, or with 21.1% (SCB, 2006).

Comparing the growth of the OMX index for all shares with the growth in total GDP for Sweden between these years will not provide a fully explanatory picture of the situation. After all, there are a lot more factors involved in the calculation of GDP than changes in the performance of national businesses. However by comparing these two figures with one another, one might receive a somewhat clearer image of the real situation. Assuming that some of the listed companies might have had a majority of their production abroad, many of the companies and people that contribute to the GDP might not be reflected by the figures presented in the OMX index for all shares. GDP estimates the value of all goods and services produced by the nation for the specific period of time, the stock market only considers the companies that are listed on it and speculations regarding these companies current and future performance.

Even though a stock index and GDP does not measure the same variables, the development of prices on stocks and other assets do affect the aggregated economical development through its effects on consumption and investment (Ekdahl, Eriksson & Marlor, 1998). The manner in which stock prices behaved during the IT boom confirms that the market deemed macroeconomic fundamentals next to obsolete. No matter what these fundamentals illustrated the stock market continued climbing, demonstrating an increased level of expectations that can be explained mainly through psychological factors (Karlsson & Olsson, 2007).

This observation highlights the level of pure speculation that ruled the Stockholm stock exchange during that period of time. Some of the differences in growth between GDP and the stock market can be validated by the different variables included in the respective calcu-
lations. However they could hardly explain a difference of 278.9 percent in just four years. When the stock market realized the amount of value that was represented merely by speculation, it led the OMX Stockholm all share index to decrease from about 400SEK in 2000, to below 150SEK in 2003 (Appendix 8.1).

1.2 Problem

The intention of this paper is not to examine the circumstances surrounding the IT-crash. That scenario worked only to illustrate the fragility of the Stockholm stock exchange and the impact a group of people can have when acting more on speculation than on business fundamentals in their investment related decisions. In fact there are many more examples worldwide illustrating the level of inflation that can derive on different investment markets when humans act more on wishful thinking rather than logic. One of the earliest documented investment bubbles was the Dutch tulip mania in the early 17th century. The value of tulips inflated to such levels that people were willing to sell their houses in order to afford to buy the, at the time, very expensive tulip bulbs to grow tulips for sale. During the heights of the tulip bubble these flowers were worth more than most houses. When the bubble finally burst they were more or less worthless (Plummer, 2006).

If one looks at the classical economic theories, these scenarios would not be considered reasonable. According to the efficient market hypothesis (EMH), overvalued stocks would be traded until their value represented the net present value of the company. The same would go for undervalued stocks; they would be traded until the price equaled the net present value of the company. All investors value information in approximately the same rational manner while those who act irrationally would be normally distributed and cancel each other out, and therefore not influence the index. Whenever irrational traders would manage to change the value of assets, rational traders would take advantage of that opportunity and equalize prices (Ruppert, 2004).

The Swedish author C-G Gyllenram (1998) disputes the concept of the rational investor inherent in the classical economic theories. He states that the average human being is not rational at all times, does not learn from all its mistakes and that it can be influenced by the opinions and actions of others. Humans have a tendency to at times be affected by their emotions in such a way that they rely more on them than on logical thinking. When it comes to investment related decisions, humans do not base their actions on logical decisions at all times. Even though logical thinking can be one factor underlying a selling or buying decision, other factors such as group mentality and previous losses or gains can contribute as well. The individual’s current mental state might at times be a larger factor than anything else when it comes to decisions regarding investments (Gyllenram, 1998).

This paper aims at examining the factors underlying the investment decisions of students currently enrolled at Jönköping International Business School, JIBS. The population was chosen due to several reasons. The resources available for the completion of this paper lends itself to the use of the easily accessible population that made for convenient sampling.
Earlier work in the subject of behavioral finance had not formally been tested specifically on students when formed. Rather the end product and result of research was presented to students. This paper aspires to begin the process in the other end, formulating conclusions based on the students instead of a more general sample. It is the hopes of the authors that the paper will contribute to understanding the decision-making progress of the specific sub-group.

The goal is to create a lucid picture of the different factors underlying the decision-making process and try to understand to which extent the student investor relies on the psychological effects of trading.

The intention of this paper is not to provide a fully explanatory picture of reality; rather it is to deliver a foundation for future research within this topic. The purpose of this study is to be able to fit into the puzzle that may in the future depict the thinking process of student investors in greater detail.

- How do students make investment decisions?
- What are their experiences and habits regarding stocks?
- What is their attitude towards risk?

1.3 Purpose

The purpose of this paper is two-fold.

Part 1: To measure the characteristics of the student population involved and interested in trading and investment.

Part 2: To look into the decision-making process and choices of the population from the perspective of behavioral finance.

1.4 Delimitations

This research paper set out to study the behavior and rational of students in their decision making process concerning investments on the stock market. For reasons relating to lack of resources the population must be limited in order to enable the research. The respondents will only consist of program students at JIBS, a faculty branch of Jönköping University in Sweden.


2 Research design

In this section the reader will be presented with the underlying philosophy and approach of this research paper. This will be followed by information regarding the primary- and secondary data; what has been collected and how they author have gone about collecting it.

2.1 Research philosophy

The core purpose of this research paper is to gain insight into the actions and behaviors of students when being faced with investment-based situations. This means that the essential objective is to seek an understanding of the nature of student’s mindset during these kinds of situations. The authors hold little, if any, knowledge within this area and therefore seek to gain more insight and create a higher awareness of the subject. By consciously searching for an answer on how, and to a smaller extent why, students act certain ways in certain situations, this study holds an exploratory nature (Saunders, Lewis & Thornhill, 2007).

2.2 Research approach

To classify the approach which a study undertakes is at times harder than one would imagine at a first glance. While at the surface it might seem to be an easy task to do, a lot of times a research can hold the characteristics of both deductive and inductive approaches (Saunders, Lewis & Thornhill, 2007).

The research topic as well as the purpose of this research aims towards gaining a higher level of understanding of the behavior of students when faced with an investment decision. While previous research on the topic of behavioral finance holds explanations for basic human behavior in these situations, the academic field of behavioral finance is relatively new and fresh. Therefore it does not claim to be fulfilled, nor does it claim to hold all the answers. Even though previous studies have dealt with the behavior of humans in general, no previous research has been conducted on the behaviors of students at Jönköping International Business School.

Combining the fact the behaviors of students at Jönköping International Business School is not determined through previous research, with the fact that the purpose of this research is to gain an understanding of it rather than to explain it, an inductive approach has been chosen. According to Saunders et al. (2007) an inductive approach;

- aims at gaining an understanding of the meanings humans attach to events
- seek a close understanding of the research context
- allows for changes of research emphasis as the process progresses
- holds no need to generalize

The underlying method of this research paper has been to collect data, through questionnaires, and thereafter analyze it in order to grasp an understanding of the student’s behavior. The research is not focused on explaining why certain behavior exists; rather it aims towards observing and understanding the detected behavior. This does not indicate that the authors has ignored the possibility to explain the findings, it only points out that focus has been on defining the behavior of the population. Attempts to derive explanations will be performed first after certain behaviors have been defined.
No matter which approach is favored one will hold both advantages and disadvantages. Therefore the researcher should focus on the needs of the purpose and the methods by which the purpose is going to be fulfilled, rather than the characteristics of the different approaches.

An *abductive* approach is not rigid in nature, meaning that this approach provides more space for alternative explanations. The researcher is not tied down to one or a few explicit explanations but rather holds the freedom to derive different possible explanations and thereby reassess the theory. This makes an abductive approach suitable for a research purpose that is focused on determining why something is happening in a specific context.

By holding a more open stance towards alternative explanations one will facilitate the possibility of taking the specific context in consideration. An inductive approach is favorable when there are little existing literature on the specific studied phenomena, in this case business students. With a vast array of existing literature most aspects has already been defined and explained, whereas with a small amount of existing literature most areas are still undiscovered. Since the theories and ideas will appear through the data collected, both the process of data collection as well as the analysis will be quite time consuming. The researcher must also accept the risk that no clear patterns or theories will appear (Saunders, et. al., 2007).

This research paper holds the above mentioned qualities; it seek a close understanding of the research context, it has changed research emphasis during the process and it holds no need to generalize. However it still holds some elements associated with a deductive approach. Firstly it does, in some instances, move from theory to data. Shefrins themes and the theory of herd behavior have been included in the questionnaire for testing. Secondly the data collected is mainly quantitative, even though the sample size itself is rather small. This then says that despite the fact that an inductive research approach was originally chosen, this research paper still holds some elements of a deductive approach. Therefore, a combination alternative, the abductive research approach, is used.

### 2.3 Data collection

This section will discuss the data that has been used in order to enable this research. It is divided into two different segments; one concerning the primary data and one concerning the secondary data. In this section there will be defined where the data has been retrieved from, how the authors has reasoned during the data collection process as well as how they have gone about finding the data.

#### 2.3.1 Primary data

The primary data is collected through a self-administered online questionnaire. This means that the respondents answered the questionnaire through a webpage without supervision. It has been chosen in favor over other methods because the possible high number of respondents in a large geographical area which can be reached relatively quickly and at a low cost (Zikmund, 2000). Another advantage compared to doing interviews is that the respondent can reply at convenient times. The questionnaire will be created utilizing the online questionnaire handler Survey Monkey.

Access to the desired population has been gained through the e-mail database at Jönköping University. This database contains the e-mail addresses to all current students at Jönköping
International Business School, which is the desired population. By using the e-mail address given to all the students we will ensure that the entire population has been reached. However the students currently attending one or several of the three other faculties incorporated within the university has not been contacted, unless they are enrolled at the business school institution. This is due to the fact that our desired population is only the students at the business school. A sample size of between 50 to 75 respondents is estimated to be satisfactory and is according to the Central Limit Theorem a valid sample size for achieving normal distribution of statistical analysis (Aczel, 2006).

The design of the questionnaire is crucial. Since there is no second chance to ask the question or follow up on answers, the questionnaire needs to be carefully designed. A questionnaire with too many and complicated questions can lead to a lower response rate if the respondent gets de-motivated and loses interest in answering (Zikmund, 2000).

With these aspects in consideration, and the fact that none of the authors has any prior experience or education regarding the creation of a questionnaire, the process of designing the questionnaire has been divided into several stages. The main condition put forward has been that before advancing to the next stage, the current stage needs to be fulfilled. The first stage was to outline the information desired and the second stage was to sketch a first draft of the questions. Inspiration for specific questions included numerous previous studies, as well as Jonas Bernhardsson’s book Tradingguiden (1996) and Hersh Shefrin’s Beyond Greed and Fear (2000). The third stage was to send out the draft to several of our classmates for evaluation. Stage number four was to collect the feedback and re-design the questionnaire, while stage five was to send it out to our classmates; both the ones who had taken part in evaluating the draft as well as some that had no insight in our questionnaire. The plan was to continue with this process of revising the questionnaire and sending it out for evaluation until no more constructive criticism were received. However after the fifth stage both the people who had received the first draft as well as those who had only received the second draft, were of the opinion that the questionnaire was more than satisfactory. Therefore the fifth stage came to be the final one.

One aspect of the collection of the primary data needs to be taken into consideration. When conducting a questionnaire, being verbal or in text, it is consider common practice to offer the respondents something to compensate them for their time (Saunders, 2007). When conducting focus groups one might offer the participants coffee and sandwiches, whereas regarding online questionnaires or questionnaires in general, you may attract people by offering special prizes to a number of randomly drawn people. Because of the authors limited financial means this was not possible to do, however despite this a satisfactory amount of responses were collected. Receiving a satisfactory amount of responses without offering any possible form of compensation indicates the fact that a majority of the individuals within the sample actually holds a genuine interest in investments and trading. If compensation or prices were offered we would have a higher probability of running into the risk of having individuals without an interest in trading answering.

2.3.2 Secondary data

The secondary data used in this research paper consists of existing theories and previous studies. The main source from which these theories and studies has been collected are JSTOR, ABI/Inform and LIBRIS; exhaustive online databases containing published, as well as non-published, academic articles. Access to these databases has been granted through the online services of the library at Jönköping University. The library at Jönköping
University has been functioning as a complement to these online databases regarding access to the literature. The literature concerning the use of statistical tools and the methodological structure of the study were found amongst the authors personal literature collections.

The first step towards finding appropriate literature, research papers and theories was to search amongst the research papers within the previously mentioned databases, as well as amongst the literature at the library of Jönköping University. This was done in order to enable a broader picture of the field of behavioral finance and answer questions of the likes of; “What has previously been done within this field on a bachelor and master level in Sweden?”, “Which are the main theories?”, “Is there a dominating theory within behavioral finance?” and “What has not yet been done within this topic but could be at a bachelor level?”. Considering the fact that none of the authors had a good insight into this branch of finance these questions needed to be answered in order to proceed with the study.
3 Theoretical framework

In this section the discussion will concern the underlying theoretical framework of the paper. The starting point will be some of the classical economic theories which underline the importance of the assumption of the rational economical human being. This will be followed by theories from the branch of behavioral finance in order to bring a more nuanced picture of the complex reality inherent with decisions of an economical nature. According to behavioral finance one cannot assume that humans are rational in their decisions in everyday life. Many factors can contribute to a human choosing a specific action over another, rationality being merely one factor. This is transcended to economical decisions where an individual may, or may not, at any given moment use rationality as the main factor in a decision-making process.

3.1 Fundamental analysis

Fundamental analysis states that in the long run a stock price will reflect the fundamental economical conditions and performance of the company. However in the short run gaps will appear between the fundamental value of a company and its stock price. When these gaps appear the nifty investor will cease the opportunity to purchase the stock of a high performance company at a discount. The fundamentalist believes that in the long run the stock price is determined by the company’s current and expected performance; therefore focus should be on finding well managed companies with a good business idea and plan traded at a discount. What a company does and how it operates are two of the most important factors for a fundamentalist in investment decisions (Bernhardsson, 1996).

3.2 Technical analysis

According to this concept, all that is known from a company’s prospect is reflected in its stock price. The price at any given moment is a reflection of the constant shift in demand and supply. Whenever the demand for a stock is higher than supply the price decreases, and vice versa. By observing the trend in price of a stock one can, according to technical analysis, predict the future trend with a satisfactory level of certainty. The trends in stock prices are driven by the market and the market consist of human actors who are prone to be affected by their emotions. The result of following trends in stock prices rather than performance of businesses is that followers of technical analysis will have a higher trading frequency, and a shorter trading horizon, than investors with other strategies (Pistolese, 2006; Bernhardsson, 1996).

3.3 Shefrins three themes

In his book Beyond Greed and Fear (2000) author Hersh Shefrin reviews the literature and research that Behavioral Finance consists of. It is one on the most comprehensive and leading books on the subject area, due to the up-to-date summaries and synopsis of the material discussed. Research is not only recounted, but sorted into connecting areas, presenting the reader with an intuitive presentation of the different theories of the subject. In this paper, Shefrins review of the most prominent authors in the subject is the foundation for the fundamental assumptions that is presented, due to its excellence in presenting the material.
Shefrin discusses three fundamental themes for behavioral finance. The themes are heuristics, frame dependence and inefficient markets. The themes serve as platforms for the different tendencies and behaviors exhibited in studies of the human decision process. Although these terms are not strictly psychological they serve the purpose as a base for discussions in the subject matter.

3.3.1 Heuristics

Heuristics – man is not capable to process all the information that one is presented with on a daily basis. While accumulating experience through the process of doing something, those experiences gives an impression of how something works. This process creates rules of thumb that can then be used when a similar situation is encountered. This phenomenon is called the use of heuristics (Shefrin, 2000).

This is especially relevant in modern trading, when the number of instruments and the density of information have increased significantly. Using heuristics allows for speeding up of the decision-making compared to rationally processing the presented information. The attractive aspect of this is the time-saving. The drawback of these heuristics is their dependence on previous experience. Relying on previous experience means that decisions can be based on non-rational or statistically unlikely occurrences. Traditional financial models assume the exclusion of heuristics, and assume all decisions being based on rational statistical tools (Shefrin, 2000).

A common case of heuristics is the use of representativeness. Representativeness is a psychological term to describe the use of stereotypes. When judging something, the stereotype that is most representative for the situation is used. A typical example is the winner/loser effect observed by De Bondt and Thaler and discussed by Shefrin (2000). Stocks underperforming the last three years create a better return than stocks that have been overperforming for the same time period. Analysts tend to be overly optimistic when it comes to past winner’s future performance and at the same time pessimistic regarding past losers. It is a case of stereotyping the stock, and completely overlooks the acknowledged statistical tendency of regression to the mean (Aczel, 2006). Similarly, it is commonly observed that trends are expected to reverse at a randomly selected point of time simply because it is unlikely for it to continue. That is a form of gambler’s fallacy; the likelihood of the outcome does not change no matter how many times the coin is flipped (Shefrin, 2000).

Other common heuristics that can be applied in the financial world are overconfidence and aversion to ambiguity. Overconfidence is the observed tendency of people to be narrow in their estimation. When asked to estimate an interval in which the answer to a question lies, for example the future price of a stock, the average low end of the estimate is set too high and the high end set too low. Meaning that when people try to estimate the answer they give too small an interval to sufficiently create statistical confidence of having the correct answer. The answers become narrow because of the overconfidence in the ability to estimate the answer. Aversion to ambiguity is similar to the phenomenon of risk-aversion. People are not willing to bet on something that is unknown. Investing in a high-risk, high-yield stock can be acceptable to a person, but the same person would not be willing to invest in a stock where those two variables are unknown (Shefrin, 2000).

There also exist two emotional heuristics. Conservatism; previously achieved information is used as a rule, even when the circumstances change. While the new circumstances are unclear people have shown unwillingness to abandon a practice or belief that has worked previously. Similarly, cognitive impressions dictate an irrational hold even in situations where
the old experience is unlikely to repeat itself. This is usually observed in people that have experienced a market crash. Typically they display more carefulness than other professionals in the same environment (Shefrin, 2000).

### 3.3.2 Frame dependence

Frame dependence references the human tendency to take a decision based on the circumstances which they were represented under. The individual tolerance for risk and value of return has been tested not to be consequential. The results differed depending on the opacity of the frame, how shrouded the information was compared to a decision baseline. The values exhibited in one question could be followed by the opposite depending on the phrasing of the question. Many times, the presentation and not the underlying information decided the answer (Shefrin, 2000). This also differs from traditional financial theory, in which all rational decisions are made with a transparent view of risk and return.

An example for illustrating frame dependence is to change the wording used when presenting a decision. A man is talking to his financial advisor, who tells him that the latest recommended investment has gone wrong. In order to avoid any greater financial loss, he should sell the asset at the current loss, and re-invest the value. To accept this advice after having to accept a loss requires a large leap of faith. Wording the advice differently, without the negative connotations off loss, for instance as “you should relocate the assets” made the advice much more acceptable (Shefrin, 2000).

The above story is an example of hedonic editing. The words used to describe a scenario or an action dictates what mental account it will fall under. This way, similar actions can be compartmentalized and perceived differently, and therefore carry different amounts of emotional impact. On the same note, the emotional impact has been measured to non-proportional rates in terms of profit and loss. The impact emotionally from a loss in experiments was shown to be upwards of two and a half times the impact of an equal profit. This is called loss aversion. Since a loss can have such a great impact emotionally, people try to avoid the emotion, and by association a loss. Depending on how something is edited, the loss aversion can be manipulated. In traditional finance all such frames are assumed to be transparent, allowing for every decision to be made on the same grounds. Frame dependency shows the propensity of people to increase the opaqueness of a frame. This propensity comes from reasons both emotional and cognitive (Shefrin, 2000).

Take for example a scenario where a person has just won 1000 SEK and have the choice taking a gamble to win or lose 250 SEK with equal probabilities. Here cognitive values set in. Those who perceive the new gamble as another independent gamble sees the risk of losing 250 SEK. The emotional effect of loss aversion therefore dictates that persons of the cognition will be less likely to take the second gamble. However, if the hedonic editing of the person instead perceives the second gamble as part of the first gamble, then the person could consider both outcomes of the second gamble as acceptable. If the gamble fails then the person is still ahead 750 SEK, not a loss of 250 SEK. Since no loss is perceived, there is no emotional impact due to loss aversion. This is called the house money effect common in gambling environments. This illustrates how frame dependency alters the perception of the outcome of a scenario (Shefrin, 2000).

Hedonic editing also shows up in how investors choose to impose rules on themselves, the subject of self-control. Self-control is necessary for investors that depend on their portfolio to a variable degree to supplement their portfolio. If the money is spent or otherwise lost it can have a significant impact on spending power. But, dividends for instance, can be com-
partmentalized as different from the other assets in the portfolio. Instead of selling an asset for a profit to get money, the dividend can be spent freely since it is independent of the portfolio. While this is one mean of imposing self-control, an asset is still expended, but without the investor controlling the amount being spent (Shefrin, 2000).

Similarly, spending or investing assets that yields poor results can produce great amounts of grief in hindsight. The pain coming from not only experiencing a loss, but also being guilty to the incurring of the loss amplifies the emotional impact of the decision. Aversion to regret, trying to minimize the future regret influences all investment decisions. Selling of assets to finance a purchase may be put off indefinitely in fear of missing a market change. Once again, depending on frames may allow for some spending decisions while discouraging others. Dividends may be spent freely while already invested portfolio assets remain untouched (Shefrin, 2000).

Finally, depending on frames affects the way people think of money. The natural way of thinking about money is to consider it only in its nominal form. While inflation is known, and can be understood it rarely impacts on peoples reasoning. Inflation exists, is acknowledged and then disregarded when money is discussed. An illusion of money is created, where only the numerical value is processed (Shefrin, 2000).

3.3.3 Inefficient markets

The third theme, inefficient markets, is the effect caused by the effects of the different psychological behaviors displayed in the first two themes. Representativeness can make traders and potential investors judge stocks based solely on past track records. Combined with overconfidence, past winners are continuously overvalued, and traded at a premium, while past losers are traded at a discount. Lakonishok, Shleifer and Vishny (1994) proved in their paper *Contrarian Investment, Extrapolation and Risk* that buying undervalued stocks and selling overvalued stock short proved significantly profitable under all circumstances.

Presuming that people use heuristics and are dependent on the frames of the decisions they are faced with then the decision process cannot be considered rational. If the traders on a market do not take efficient decisions then the market does not reflect efficient action. In the end this means that the market does not reflect all available information, but instead all available information considered important by those actively buying and selling (Shefrin, 2000).

The inefficient markets theme comes down to a single reasoning. Because people are possibly affected by one or several psychological behavior modifiers, they do not trade rationally. Since they do not trade rationally, the movements on the market are not efficient. Since the movements on the market do not reflect the available information, stock price are not equal to the fundamental value of the actual company. That is the end effect the reasoning for behavioral finance. Note however, that this effect does not lead to risk-free profits. Despite the mispricing there is the possibility of non-fundamental risk; unpredictable risk due to the themes behavioral finance (Shefrin, 2000).

3.4 The Efficient Market Hypothesis

The different psychological and financial factors that make up Behavioral Finance adds up to an argument of market inefficiency. The subject of market efficiency/inefficiency has
long been debated, and it lies far beyond the scope of this paper to discuss this matter. To nuance this, the other side of the pendulum is included here in the theory. The traditional Efficient Market Theory, as initially formulated by Eugene Fama, is included as a counterweight to the efficient market critical writings of Shefrin, et al.

The hypothesis states that in an efficient market, where people act rationally, prices of a commodity will reflect all the available information. That is, in the financial market the price of a stock reflects all available information of the factors that influence the price. Only new information will affect this pricing. The power of arbitrage is said to keep prices at parity; if riskless profit was possible without investing capital then the prices would be adjusted by trade until such opportunities are nullified (Ruppert, 2004).

As a consequence of this information availability it is not possible to consistently gain above average returns. The few stock traders that consequently beat the market, of which there exist a few famous examples, can be considered random occurrences within a distribution of very large size (Ruppert, 2004).

The proposition that the market prices moves efficiently was examined as early as 1953 by Kendall. He was unable to discern any logical patterns, observing a market that evolved regardless of the past performance, indicating erratic psychological behavior on the market. Further studies revealed that this should be considered logical. An example of the scenario if prices were predictable was used; if everybody knew that a stock is currently worth a hundred dollars would be worth a hundred and ten in three days, then everybody not owning the stock would want to buy the stock. However, those already owning the stock would not be willing to sell the stock for the current price since they know that it will be worth more in three days. The only way to buy the stock immediately would be to pay the expected future price, leading to an instant price increase. So, a forecast of future performance improves current performance. In effect, prices are affected by any new information which by definition is unknown before it comes into existence. Prices are therefore unpredictable, leading to what is called the random walk of prices (Bodie, Kane and Marcus, 2007).

Part of the Hypothesis, as suggested by Fama, describes how the premises can exist in three different states depending on the individual market. Bodie et al. (2007) describes how the three forms of the Efficient Market Hypothesis differ in the definition of the term “all available information”;

- The weak form states that stock prices have internalized all the information that can be found by analyzing any single stock. Since past stock prices, trading history and trading volume are all publicly available, any possibility of using it to predict future performance would already have been discovered. As such, trend analysis holds no ground as a tool for analysis.

- The semi-strong form say that in addition to past stock price, information such as fundamental data on the company, quality of management and product line are all included in the current stock price. All publicly available information, including forecasts and the state of the balance sheet are all reflected in the market stock price.

- The strong form has the most extreme definition of “all available information”. All information that exists regarding any individual stock is included in its price, even confidential information known only by company insiders. This comes with a certain controversy, since insider trading is illegal in most places, and those that trade on privileged information face the risk of being incarcerated.
Ruppert (2004) lists three primary defenses of the EMH in his chapter on Behavioral Finance;

- Investors are considered rational, so market values equal their net present values since all available information is interpreted in the same rational way by everyone.

- Irrational investors can exist, but are considered to be normally distributed. Their willingness to overpay and undersell assets will cancel out their influence.

- Finally, rational arbitrageurs will eliminate the influence of large populations of irrational traders that all share the same misconception of an asset's value.

Since its creation in the 1960s the Efficient Market Hypothesis has been scrutinized repeatedly. There exist several points of criticism leveled against it. For example, while trading following rational principles gives the market prices a random walk, prices having a random walk does not have to be the result of rational trading. The best example of such irrational trading is the tendency for loss aversion. People avoid selling assets that have decreased in value to avoid having to accept final loss. Testing has shown a loss to have up to twice the impact of an equally sized gain, the Prospect Theory by Khaneman and Tversky (Ruppert, 2004).

The third line of defense for the EMH is that when irrational traders manage to change prices of assets to values differing from their net present value is that rational traders will take advantage of the created arbitrage opportunity. Doing so can be risky and requires an almost perfect substitute to hedge with. Since irrational value increases often depends on a unique event such as a news report, many times there is no suitable hedge available (Ruppert, 2004).

### 3.5 Herd Behavior

Mankind has tried to simplify economic behavior for centuries in order to enable an explanatory perception of complex reality. Different classical theories have been using different methods in order to create simplified economic models. While the different theories might vary in complexity and explanatory power, they all have one common characteristic; mankind is viewed upon as a fully rational being which takes carefully weighted economic decisions at all times. These decisions are assumed to be based on all available and relevant information. Within these classical theories rationality is defined as decisions based on mathematical formulas.

According to Gyllenram (1998) there are three main statements underlying the basic assumptions of classical economic theories;

1. People do not act irrationally
2. People learn from their mistakes
3. People make their choices independently of the opinions and actions of others

*People do not act irrationally*

This statement might be considered as the core of classical economical research. People will simply not act in any manner that diverges from what can be considered as rational be-
behavior. An individual will not voluntarily cut oneself with a knife while chopping vegetables, presuming one does not find satisfaction in such an action.

**People learn from their mistakes**

The second statement acts as a consequence of the first, whenever people suffer negative effects from an action they will associate that action with the appropriate negative effect and therefore not repeat it. If you have cut yourself while chopping vegetables you will take extra precautions the next time you chop vegetables in order to avoid that occurrence.

**People make their choices independently of the opinions and actions of others**

According to the third statement, one's rationality is affected by neither the actions, nor the opinions, of others. One might take the opinion of others in consideration regarding some issues. However one will not act in accordance with them if those opinions contradict rational behavior. One will not cut oneself while chopping vegetables merely because another person might find that pleasurable.

However Gyllenram (1998) argues that by approaching the stock market with the view that all the actors are rational at all times one will never grasp a comprehensive understanding of the stock market. All markets are made up by the actors on it, namely humans. Humans are by nature at times affected by their emotions in such a way that they will diverge from what would be consider rational behavior. While the classical economical school fills its function of describing the cause and effect relationships within financial markets it fails to depict the human aspect inherent with the very same.

People have the ability to function in two entirely different modes. They either work fully individually with an independent set of thinking, or they act in accordance with a specific group behavior following the rules and values of that group. The individual shifts from these two modes, at times functioning as an individual while at other times following the herd. To determine the individual's actions in advance is an extremely tough task to accomplish while the most probably action of a group can be determined fairly accurate in advance (Plummer, 2006).

C-G Gyllenram (1998) illustrates the power of herd behavior by using smoking as an example. There are hardly any individuals who are unaware of the harmful results of smoking, at least not in the more educated parts of the world. Yet there are a large number of smokers. If humans functioned as rational individuals they would hardly pick up the habit of smoking. The first time one smokes a cigarette is more or less an unpleasant experience with coughing and nausea as a result. A rational human would learn from that experience and never smoke a cigarette again. However humans in general tend to continue with this habit, despite the fact that the first times are associated with negative consequences. If the first experience is negative, and one is aware of the fact that cigarettes can cause lung cancer and is addictive, a rational individual would never continue with this habit. After all, the pleasure of smoking will not appear until one is addicted to the nicotine in cigarettes. The logic of a rational individual applied on this scenario will not explain why people pick up the habit of smoking. However if one takes into consideration that humans tend to act in accordance to the behavior and values of groups it will suddenly become possible to both understand and explain why humans smoke.

Whenever a group of individuals have a common goal or purpose, and are able to find a forum in which they can meet, a herd can be formed. No matter which individuals the herd consists of, whether they differ in personal values, level of intelligence, ethnicity or any
other factor, when belonging to the herd they will change their behavior. The transformation from an individual to a member of the herd will inject the human with a collectivist way of thinking. This in turn will make the individual think and act in a manner which is substantially different from the way that person would have acted on her own. The belonging to a group results in a shift of responsibility transferring from the individual to the entire group (Gyllenram, 1998).

Individuals are inherent with a desire to belong to a group. This desire will cause the individual to adapt her behavior in order to be accepted by the group. In order to be accepted by the group, and thereby take part of it, three criteria’s must be fulfilled. The first one is that the individual must feel as if she belongs to the group, and thereby identify with it. The second is that the individual must accept the rules, norms and values of the group. The third criterion is that the individual must accept the leader of the group (Plummer, 2006).

Herd behavior within financial markets is not to be considered as a constant factor and its effects vary from time to time. The denominator which determines whether or not herd behavior will be present at any given time, and to which extent it will affect these markets, is emotions. Only in emotionally charged situation will one be able to detect herd behavior, and the higher the level of emotion involved the higher will the effect of herd behavior be. In the instances where herd behavior is active on financial markets the actors, namely the investors, will all follow the leader of the herd. The leader on any financial market is the price. Here lies the explanation of financial booms and crashes; in severe ups- and downs on the stock market the investors will all follow the price, and when everybody follows the trend of the price they will create over- and under valuations (Gyllenram, 1998).

### 3.6 Risk in relation to return and return

A cornerstone of financial knowledge, and other related areas, is the fact that there is no free lunch. When cash or other liquid resources are invested into assets, there is a baseline requirement associated to that asset. Available to the investor is the smallest possible return without any risk, the risk-free return. In order to attract resources, all assets must be able to trump this return with a minimum increase in risk. When the risk associated to the asset rises, the return must increase in tandem to make the asset attractive. An investment in an asset that does not follow this line of risk-return, the capital market line, is considered inefficient investing (Bodie et al., 2007).

Age can hold an influence on the individual risk-level in addition to the mathematical return. Young people might hold a higher level of tolerance for risk, as part of a more aggressive investment strategy, due to the fact that they have more time to recoup potential losses (Personal communication, Urban Österlund 2008-03-18).

### 3.7 Previous studies

The previous research on behavioral finance at bachelor and master level in Sweden is somehow limited due to the fact that it is a relatively new and unexplored field of research. However there are some papers depicting this topic from slightly different angles, with the remarkable resemblance of the time period in which they have been written. The researches with the highest value for our field of study have all been conducted in the beginning of the century, in the aftermath of the financial crisis caused by the IT bubble. This phenomena is
most likely not coincidental since the only rational and logic aspect of the IT era was the bursting of the bubble. While many investors were caught in the hurricane’s eye and thereby somehow blinded by the situation, when viewed upon in retrospect it was not hard to understand that the investor’s behavior during this period was not rational at all times. Therefore it makes sense that research concerning the rationality of investors would surface in the aftermath of a crisis caused to a great deal by lack of rationality. These previous studies discussed below all attempt at determining if psychological factors influence investors, and if they do, why and how.

The collection and use of information is one factor that has been highlighted. According to Gustavsson and Svensson (2003) the private investor does not process information in accordance to the classical financial theories. All actors on a market might have the same access to information; however the information is not transparent. Different actors interpret information differently depending on the format in which it is presented and the channel which presents it. The argument is therefore that people interpret information differently depending on who presents it and how it is presented; when a person does not find the presented information transparent she will not act on the same basis as someone who finds the same information from the same channel as transparent. In the cases when such a scenario appears psychological factors will come into play and thereby diminish the level of rationality in the decision making process.

In their bachelor thesis, Axell, Axsäter, Landqvist and Rydberg (2002) aim at gaining a better understanding of the decision making process of the private investor. One of the subpurposes of this thesis is to develop the perceived need for consulting and guidance amongst private investors in their investment decision process. By having 75 private investors who were clients at Bankaktiebolaget JP Nordiska (which later became Kaupthing Bank Sverige through acquisition) filling in a questionnaire, one of the conclusions was that the average private investor laid a great deal of emphasis on this service provided by the bank. It appeared that the private investor did rely heavily on fundamental analysis when collecting investment prospects and that the fundamental analysis conducted and delivered by the brokers at JP Nordiska was a highly coveted service. Their study also shows that besides the fundamental analysis’ conducted by the brokers, the brokers personal opinions concerning companies and the market in general was a highly sought after service. When in doubt, the customers of JP Nordiska relied on the opinions of their broker.

In Rationalitet I Beslutsfattande – En Empirisk Studie i Rationalitet hos aktieinvesterare (2001) Björklund and Erlingsson explored the internal and external factors which influences the private investors ability to act rational on the stock market. While the internal factors focused on the investor herself and different factors that could influence her ability to remain rational, the external factors were focused on three main stakeholders; the broader mass media, the government and former stock brokers now active in other fields. The reason for choosing former stock brokers and not current ones is justified with the reasoning that they wanted an optimal level of honesty on their questions. These former brokers, describing their previous positions as salespeople rather than consultants, illustrated the logic of their job assignments and how their bosses reasoned. Externally they should present themselves as consultants with the aim of maximizing the profits of their clients. Internally however their only mission was to raise as much money as possible for the brokerage firm through commissions. Since these commissions were the main source of income, and directly linked to the wages of the brokers and analysts’, the brokers were more focused on “advising” their clients to constantly purchase and sell stocks rather than helping them make profits. For every time a client purchased, or sold, a position both the broker and the
brokerage firm earned money in commission. Therefore brokers, brokerage firms and analysts alike could, according to Björklund and Erlingsson (2001) not be described as trustworthy sources of information regarding investments in stocks. Obviously they did not want their clients to experience a losses; however their main objective was to raise capital through commission. The occurrence of both these scenarios coinciding would apparently be the optimal situation; still their main object is to nurture their own finances.

The conclusion here could then be that since information is not transparent one can not presume that all private investors receive it in the same format. Even if they do so, the assumption can still not be made that they will interpret the piece of information in the same way. Axell et al (2002) provided some evidence that private investors are likely to depend on, and trust in, the advice of their brokers. Combining the results of these two research papers with the results of Björklund and Erlingsson (2001) depicts a somewhat frightful scenario. If private investors do trust the advice given to them by their brokers, and this advice can easily be misinterpreted, combined with the claim that brokers and brokerage firms main objective is to encourage their clients to trade, the private investors finds themselves in a precarious situation.

These three research papers, holding somewhat different purposes and therefore reaching different conclusions, all hold the same stance towards behavioral finance as a scholarly topic. They concur in the statement that no theory within behavioral finance is dominant in the field. However they all accentuate the importance of Shefrins Beyond Greed and Fear and the importance of the concept of herd behavior. Björklund and Erlingsson (2001) describe two types of herd behavior; one that is justified by changes in fundamental factors such as an increase in interest rates, and on that is more irrational and base on non-fundamental factors.
4 Method

This chapter will provide a deeper insight into the methods applied to this study. It will illustrate the approach and the different steps taken during the course of the time. It will describe how the data has been collected and analyzed. As a result of the latter there will be a discussion regarding the formulation of the questionnaire. The main purpose of this chapter is to provide the reader with a deeper insight into thinking- and working process behind the results of the research.

4.1 Survey theory

Saunders et al. (2007) lists five variables that are crucial to maximizing the number of responses to a questionnaire.

- Careful design of the questions.
- Clear layout of the questionnaire form.
- Lucid explanation of the purpose of the questionnaire.
- Pilot testing.
- Carefully planned and executed administration.

These five points are fundamental to the questionnaire upon which the primary data collection for this report is gathered through. The importance of a well-planned questionnaire is not only to ensure a sufficient response rate, but to also make sure that the data gathered is usable. To carry out the questionnaire as a self-administered test holds several advantages as has been discussed in the beginning of the previous section. The subsections of this section will go over how compliance to the five variables is handled.

4.1.1 Designing the questions

Creating the questions is a process involving discussions. Possible additions are analyzed from several angles. For a question to be included it needs to pass several criteria. First of all, it must be able to generate relevant data. Secondly it must be able to generate honest data. A question is no good if the answers cannot be used. This is a common theme in behavioral finance, with traders not looking at their actions rationally and rationalizing illogical and even unprofitable trading and investments (Shefrin 2000).

Also, as a one-time self-administered questionnaire, the questions and answers needs to be clearly formulated so that any given respondent interprets it similarly. A questionnaire can typically be used to record three different sorts of data; opinions, behaviors and attributes (Saunders, 2007).

In this paper, questions of behavior will be compared to questions of opinions to measure the awareness of discrepancy between belief and action. Previous studies in the subject of behavioral finance have shown that people do not treat profit and loss rationally. Usually different values are associated with the different outcomes of an investment. Cross-referencing these questions will show how well these findings correspond for the chosen sub-population of this paper. The results of the cross-referencing can be used in compari-
son to the attributes of the subjects’ to see if there is a recognizable pattern or cause for the findings.

4.1.2 Layout of the form
General layout and design of the form are those which are available on Survey Monkey. Creating the questionnaire is complex without adding in the design elements as an amateur. An import point is that the questionnaire has been kept to as few screens or even a single one if possible. A questionnaire that seems to drag on without a visible end is less unlikely to be completed (Saunders, 2007).

The aim of the questionnaire was to be presented as professional and simple as possible, in order to not discourage any respondents. In such cases that questions require longer texts these will be subject to careful editing to not include unnecessary text or clutter.

4.1.3 Explaining the purpose of the questionnaire
Since the questionnaire is HTML-based, people first needed to receive a link to it through an e-mail. This e-mail included an introduction to the purpose of the report, the subjects that were discussed and the writers of the report.

4.1.4 Pilot testing
Pilot testing was carried out in several steps, and the design and the questions were re-adjusted in accordance with feedback. This feedback was gathered primarily through semi-formal interviews using open-ended questions. The prime objective of the pilot testing was to test the reliability of the questionnaire. If a question is reliable, it will be continuously interpreted the same way independent of the respondent (Saunders, et al. 2007). This is vital for a questionnaire where behavior-recording is the main purpose. If the reliability of the questionnaire is good, then the odds for obtaining good data has been increased.

Testing for reliability can be done via three common methods. The tests re-test, where the same questionnaire is re-administered under circumstances simulating the original ones to the same subject. Reliability can then be measured by comparing the two tests and watch for differences in the answers. The method suffers from a few drawbacks. Primarily, in order to use the method, subjects must be convinced to take a test repeatedly. Secondarily, the more time that is allowed to elapse between the times of testing, the greater the likelihood that the tests will have different answers (Saunders et al. 2007). In this paper this method is not a good fit, since just persuading the chosen population to answer once only has an 11% likely response rate (Saunders et al. 2007). It is therefore unlikely that a second identical test will be answered, considering that the test is voluntarily taken in the first place.

The second approach to reliability is to include “check questions”. These questions are similar to questions already answered and offer a direct way to test the reliability of the answers. However, this can substantially lengthen the questionnaire and discourage respondents from finishing because of repetitious questions (Saunders et al. 2007). Due to the risk of decreased response rate, that approach will not be heavily utilized in this paper.

The third method of testing reliability of answers is to have the questions compared to other similar questions to test for inconsistency. This statistical approach has been used exten-
sively in this paper to both test the reliability of the data and analyze the result (Saunders et al. 2007).

4.1.5 Planning and Execution

The questionnaire is distributed via e-mail, which is one of the quickest and the most inexpensive way of communicating information to a large amount of people. As such, the execution of the administering will require very little time and effort. Such questionnaires have a very low response-rate as previously stated, and it is likely that the majority of those that will in fact respond will do so quickly. A majority of the work will be put into planning as a consequence.

4.2 Survey Monkey

“Survey Monkey is an intelligent survey software for primates of all species and helps anyone to create professional online surveys quickly and easy” (Survey Monkey 2008)

Survey Monkey allows one to manage the questionnaire in three major steps: survey design, response collection and results analysis. There are a wide variety of ways to design the questionnaire with help of multiple choice questions, rating scales and drop-down menus. With a finished design one collect the responses by posting a web link to the desired respondents. Survey Monkey then collects and summarizes the responses for analysis. The questionnaire can only be answered once per IP address. There are two versions with different tools available. One is for free with somewhat limited features such as a maximum survey length of 10 questions and one with a monthly fee of $20. The questionnaire used for this research paper consists of only 10 questions and held no need for the data analysis tools available in the charged version, therefore the free version was utilized for the purpose of this research.

4.3 The questionnaire

For the specific questions, see the appendix or the empirical findings. Here they will be referred to by numerical appearance.

Question 1-2: The purpose of question 1 through 4 is to establish the background of the respondent. These attributes allows us to put their opinions and behaviors in a context, while also enabling us to establish the specific features of the population.

Age can hold an influence on the individual. Young people might hold a higher level of tolerance for risk due to the fact that they have more time to recoup potential losses. Gender is used as a pure statistical observation over the population (Personal communication, Urban Österlund 2008-03-18).

The study has focused on students at Jönköping International Business School, meaning that it could be reasonable to assume that a majority of the respondents holds business and economics as their major area of study. However this assumption cannot be approved without further investigation, therefore question 2 aims at establishing the area of study of the respondents.

Question 3-4: Questions 3 and 4 are somewhat intertwined since they deal with the respondents trading activity. The third question regards the frequency of trading while the fourth question concerns the level of experience. Part of the respondent’s purpose of trad-
ing should be reflected in how many times per year she trades. This could be of interest when compared to the answers to the questions involving loss and risk aversion.

**Question 5:** Concerns the different tools and sources of information the respondent use in her investment decisions. The alternatives available are examples of internal and external influences. The purpose of this ranking is to provide us information regarding the factors that underline the investment decision. How influential media and family are considered among the external influences can point towards several tendencies, such as following the herd, having low confidence in ones judging ability or having overconfidence. Ranking of the different internal and external influences creates a picture of the decision-making balance.

**Question 6:** The importance that a respondent gives to the subject of the company’s area of activity can be interpreted in many ways. It can be considered care for corporate social responsibility or environmental causes, but it can also be a matter of profitability. A common advice is to only trade with companies whose area of activity you can understand and relate to. It can also be construed as an effort to only invest in market segments that will provide good returns in the future. In this questionnaire the answer to this question can be compared to the amount of external influence that the respondent might be affected by. Similarly, the amount of time spent on doing private analysis can correspond to the propensity for giving importance to the area of activity.

**Question 7:** The last four questions deals with recording the behaviors of the respondents. In question 7 a person’s confidence levels are tested. Persons with faith in their ability to perform a correct forecast who considers the internal influences more important should, if they are rational, trust their own decision. If they would display insecurity in their choice of answer, this could signify irrationality or propensity for loss aversion.

**Question 8:** The purpose of question 8 is similar to that of question 7. The behavior observed can illustrate whether the respondent is easily influenced by peer pressure and shows tendencies towards herd behavior. A respondent that lists external influences such as friends and family as important to a large degree or higher might also decide against her own investment decision. If this is done after receiving the new information it could be perceived as a sign of a rational and consequent behavior.

**Question 9:** This question is a classic test-book example on how to examine the respondents frame dependence (Shefrin, 2000). How the decision is framed subconsciously by the respondent will decide whether she will take the gamble or not. A person that views the gambles as a single frame are more likely to accept the gamble since the worst possible outcome would be a net gain of 750 SEK. A person that frames the decision as separate from the first gamble is more likely to not take the gamble because of the presence of loss aversion. The answer will help determine the decision-process that the respondent uses in other parts of the questionnaire.

**Question 10:** The question asks for the preferred option among the alternatives. The question cannot be rationally answered since there is no optimal solution. Without more exact parameters some or all of the alternatives could possibly be optimal. Instead, the question will record the subjects approach to money management and preferred investing option. It can be further derived to how the respondent positions herself to handle risk and loss.
4.4 Testing for correlation with non-parametric methods

Using statistical means to test for significant correlation between two or more variables is a practice useful to measure the influence between the variables. Correlation is defined in statistics as “the measure of the degree of linear association between the two variables”. Correlation is normally denominated as the Greek letter ρ. When ρ equal 0, variable movements are independent. When it is equal to 1 the variables will move equally in the same direction, with the opposite holding true for -1.

When testing the student investors it is assumed that the respondent sample will not be normally distributed. The narrow population focus of business students currently enrolled at JIBS will produce homogenous responses. To compensate distribution-free methods, non-parametric testing, will be utilized (Aczel, 2006).

When calculating a correlation coefficient there is an assumption that the tested variables are also normally distributed. When data is classified as ranks or is assumed to have a non-normal distribution the common method to calculate correlation is Spearman’s ρ. Ranks are the method of having the actual observations be in the form of ranks in ascending or descending value (Aczel, 2006).

The test is done at the α = 0.05 level. The conditions are;

\[
H_0: \rho = 0 \\
H_1: \rho \neq 0
\]

Meaning that the null-hypothesis is that there is no correlation between variables. If the null-hypothesis is rejected there is statistically significant proof of a correlation.

In this paper question alternatives was not in the form of ranks, in order to better communicate the meaning of the answer. Instead the approach has been taken to have observations ranked numerically with ascending values going from the weakest to the strongest or the lowest to the highest when processing and analyzing the observations. The tests are done in SPSS 14.0, the results are given in the analysis and the testing procedures can be found in the appendix.

4.5 Attributes, Opinions and Behaviors

Opinions measure the subjects’ belief regarding specific issues, and can be used to gauge whether the subject feels that something is true or false. This variable is the most appropriate for measuring the factors which influences the person in her investment behavior.

In contrast, the behavior-variable records a subject’s action in a given situation. Describing a scenario and giving different ways of handling the situation allows for observation of less conscious values. This is useful as it reduces the “noise” created by what values the subject finds it ok to express, or what the subject feels is the “right” answer to the test. All people have the irrational ability of overvaluing their own abilities, often rationalizing away failures as the fault of the environment (Peters & Waterman, 1983).

The third variable, the attributes, is the core of a subject. It is not what the subject does or thinks, but rather the components that together form the personality of the subject. Attributes include, gender, age, education etc. (Saunders, et al. 2007). The intent of this pa-
per is to use classic demographic attribute data such as age, gender and education as a sort of platform which the behavior and opinions of respondents are compared to. The attributes and opinions will be analyzed in light of behavioral and financial theory.
5  Empirical findings and analysis

This section contains the statistical findings of every separate question that was included in the questionnaire. The actual question and its answers will be written down together with a breakdown of the answers, both numerical and percentage-wise. In some cases a question has been skipped by one or several respondents. Such non-response is included in the statistics in order to have a percentage breakdown reflecting the responses. The first part will put forward the answers from the questionnaires without any comments from the authors. This act is a conscious one and done in order to enable the reader to develop an understanding of her own before the authors presents their interpretations. The second part will contain the analysis of the responses.

5.1  Empirical findings

Question 1 – Gender and Age

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>30</td>
<td>56,60%</td>
</tr>
<tr>
<td>Female</td>
<td>13</td>
<td>24,53%</td>
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<tr>
<td>Skipped</td>
<td>10</td>
<td>18,87%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-21</td>
<td>9</td>
<td>16,98%</td>
</tr>
<tr>
<td>22-25</td>
<td>28</td>
<td>52,83%</td>
</tr>
</tbody>
</table>
26-30 6 11.32%
30+ 0 0.00%
Skipped 10 18.87%

Question 2 – What is your major area of study?

Figure 3 - Area of study

<table>
<thead>
<tr>
<th>Area of Study</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business / Economics</td>
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<td>83.02%</td>
</tr>
<tr>
<td>Law</td>
<td>7</td>
<td>13.21%</td>
</tr>
<tr>
<td>Engineering</td>
<td>1</td>
<td>1.89%</td>
</tr>
<tr>
<td>Skipped</td>
<td>1</td>
<td>1.89%</td>
</tr>
</tbody>
</table>

Question 3 – How often do you trade with stocks?

Figure 4 - Trading activity

<table>
<thead>
<tr>
<th>Times per year</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>14</td>
<td>26.42%</td>
</tr>
<tr>
<td>1 to 3</td>
<td>12</td>
<td>22.64%</td>
</tr>
<tr>
<td>4 to 7</td>
<td>6</td>
<td>11.32%</td>
</tr>
<tr>
<td>7+</td>
<td>20</td>
<td>37.74%</td>
</tr>
<tr>
<td>Skipped</td>
<td>1</td>
<td>1.89%</td>
</tr>
</tbody>
</table>
Question 4 – For how long have you been trading with stocks?

![Bar chart showing trading experience by years](chart)

**Figure 5 - Trading experience**

<table>
<thead>
<tr>
<th>Years</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>23</td>
<td>43.40%</td>
</tr>
<tr>
<td>3-5</td>
<td>18</td>
<td>33.96%</td>
</tr>
<tr>
<td>6-10</td>
<td>10</td>
<td>18.87%</td>
</tr>
<tr>
<td>10+</td>
<td>2</td>
<td>3.77%</td>
</tr>
<tr>
<td>Skipped</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Question 5 – How important are the following sources for your investments?

![Bar chart showing sources of information](chart)

**Figure 6 - Sources of information**

The numbers in bold in the matrix are the most common rating of importance for that category.

<table>
<thead>
<tr>
<th>Sources</th>
<th>Not at all</th>
<th>To a small degree</th>
<th>To a large degree</th>
<th>Exclusively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamental analysis</td>
<td>6</td>
<td>15</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>Technical analysis</td>
<td>13</td>
<td>24</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Media</td>
<td>3</td>
<td>23</td>
<td>22</td>
<td>4</td>
</tr>
<tr>
<td>Friends and family</td>
<td>8</td>
<td>19</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Analysts</td>
<td>7</td>
<td>18</td>
<td>25</td>
<td>2</td>
</tr>
</tbody>
</table>
Question 6 – To what degree does the company’s area of activity matter when you decide whether to invest or not?

Figure 7 - Importance of area of activity

<table>
<thead>
<tr>
<th>Numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>2</td>
</tr>
<tr>
<td>To a small degree</td>
<td>18</td>
</tr>
<tr>
<td>To a large degree</td>
<td>28</td>
</tr>
<tr>
<td>Exclusively</td>
<td>4</td>
</tr>
<tr>
<td>Skipped</td>
<td>1</td>
</tr>
</tbody>
</table>

Question 7 – In conjunction with a general stock market decline the value of one of your investments decrease more than the average decline. If no fundamental factors seem to have changed, what do you do?

1.) You keep your position, waiting for the market to turn.

2.) You await further development of the stock price.

3.) You sell your investment to avoid further losses.

Figure 8 - Action during a stock market decline

<table>
<thead>
<tr>
<th>Option</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
<td>45.28%</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>47.17%</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>7.55%</td>
</tr>
<tr>
<td>Skipped</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Question 8 – You are about to go to lunch. After the lunch you are planning to purchase stocks in a specific company which you have been keeping an eye on for the last few weeks and now deem to be attractively priced. During lunch you discuss the stock with your friends, but to your surprise they advice against purchasing it. After lunch you log on to your online broker, what do you do?

1.) You refrain from making the investment after your discussion with your friends.

2.) You postpone the investment in order to further development your analysis of the company.

3.) You stand by your decision and purchase the stock.

Figure 9 - External influence

<table>
<thead>
<tr>
<th>Option</th>
<th>Numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>7.55%</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>56.60%</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>33.96%</td>
</tr>
<tr>
<td>Skipped</td>
<td>1</td>
<td>1.89%</td>
</tr>
</tbody>
</table>

Question 9 – You have just won 1000 SEK during a TV game show and are offered to take part of a new gamble. The conditions for the gamble are as follows; you have a 50% probability of winning 250 SEK and 50% probability of losing the same amount. Do you accept the proposition?

Figure 10 - Coin-flip situation
<table>
<thead>
<tr>
<th>Numbers</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>35</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
</tr>
<tr>
<td>Skipped</td>
<td>0</td>
</tr>
</tbody>
</table>

**Question 10** – You are about to create a new portfolio and have the following alternatives at hand;

- **Stock A** with an expected return of 15% +/- 20%
- **Index fund B** with an expected return of 7% +/- 10%
- **Government bond C** with guaranteed return 3%

Which of the following alternatives would you prefer?

1.) A majority of the portfolio in stock A, and the rest allocated amongst the other alternatives.

2.) A majority of the portfolio in index fund B, and the rest allocated amongst the other alternatives.

3.) A majority of the portfolio in government bond C, and the rest allocated amongst the other alternatives.

4.) A free distribution between stock A, index fund B and government bond C

![Figure 11 - Portfolio management](image)

<table>
<thead>
<tr>
<th>Option</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28</td>
<td>52.83%</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>18.87%</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>7.55%</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>20.75%</td>
</tr>
<tr>
<td>Skipped</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

The empirical findings collected through the questionnaires suggest that the typical student investor at JIBS is a male between 22-25 years of age, majoring in business and economics. He prefers to use fundamental analysis as a helping hand in his investment decisions, while he at times may use technical analysis as well.
He might listen to what his friends and family have to say regarding different investments, however he is more apt to listen to the opinions of media and professional analysts. Even though he takes external influences into consideration he still relies more on his own ability. This typical JIBS investor put emphasis on the company’s area of activity, which might be one of the reasons why he does not fear general market declines. He is a gambler at heart which might explain why he prefers high risk stock investments in favor of safer options.
5.2 Analysis

The analysis is divided into two main categories, one regarding the general characteristics found in the sampled population and the observed decision-making recorded in the behavior questions. Behavior will be further sub-divided with regards to other questions in order to extrapolate some knowledge of the underlying mechanic.

5.2.1 Measuring Risk and Loss Aversion

In order to gain an understanding of the preferred risk relationship and perception of loss aversion questions 7 and 9 will be used to sort the respondents after recorded behavior. The found subgroups will be further subdivided after responses from question 10. This is to find out if their actions are logical or irrational, and if they are the same without regards to the presented frame.

Respondents are first divided by question 9. Question 9 is a previously formulated way by researchers in the behavioral finance area to examine the respondent’s use of frames. The question poses the choice of whether or not to take a gamble for 250 SEK. There is a 50% chance to both win and lose. The question also states that the respondent has already won 1000 SEK, which is a vital part of the situation. Respondents that say yes to the gamble display the use of a gambling frame; even if the loss of 250 SEK is incurred the respondent is still 750 SEK ahead. If the respondent chooses not to take the gamble that signifies a lack of framing for decisions. All decisions are taken independently depending on the possible gain or loss. The gamble presented is a less than desirable one: winning or losing a smaller amount of money without any odds in the favor of the respondent.

The choice to take the gamble or not can also interpreted as the respondents chosen risk level. This would however be a rather crude way of measuring. Instead, during the subdividing and sorting after preferences on the following question a picture of risk behavior is gained.

Out of the 53 respondents 35 choose to take the gamble. For now this group is referred to as sub-group 1. The last third, consisting of 18 out of the 53 did not choose to take the gamble. This is sub-group 2. This is the first subdivision, divided by how the respondents are affected by frame dependence.

In question 7 respondents are posed with the question of whether to hold on to an investment when the value begins to fall, or to retain it for one of two motivations. The motivations are because they believe that the market will turn, or because they believe in the value of the investment. Additional information for the decision was provided in the form of the fact that the investment should not lose value according to the respondents own research. That means that the decision is dependent purely on the respondent’s preference for investment managing and / or confidence in his or hers analytical ability. Selling the investment indicates the ability to cut losses short, accepting a small loss in order to avoid the occurrence of future larger loss. To avoid handling the losing investment indicates a reluctance to accept a loss, preferring to keep the investment despite the falling value. A loss must only be accepted if the investment is sold, hanging on to it means not having to accept it. This phenomenon, as discussed in the theoretical framework, is called loss aversion.

In subgroup 1 32 of the original 35 chooses to hold on to the investment. Only 3 of the respondents of this group are recorded to accept the bad investment and incur the minor
loss associated with it. The majority of this sub-group displays the same frame of reference as in question 9. Instead of taking decisions based on the current situation, they choose to hang on to the investment believing in a better future outcome. Similar to question 9, the riskier path is taken since it has the possibility of providing an incrementally greater future. While this is a risky decision, it is in line with the previously recorded behavior and therefore not random or irrational. On the other hand, those 3 that did take the gamble in question 9 but sells the investment do not display a consequent level of risk or use of frame. In one situation the riskier choice was taken, but in the other one the safer path was preferred. The combination of answers indicates that the decisions are inconsistent with each other, and could just as likely be random.

In sub-group 2, only 1 respondent displays the same level of risk as in question 9. 17 out of the 18 possible all chooses to hold on to the investment. This is inconsistent with the previously recorded behavior, and just as the 3 respondents in sub-group 1 the overwhelming majority of this group does not appear to take decisions based on a consistent and clear frame depending on the gains or losses possible.

Based on this division from two questions we find that of the original 53 respondents 33 are acting rationally on a consistent basis. Of those 32 chose a high level of risk and only 1 a low level of risk. The majority of all respondents were prone to risky investments and decisions. Those who did not choose a risky level displayed great levels of inconsistency in decisions, with only the 1 respondent acting rationally. In addition to selecting risky levels of investment the majority also did so consistently. The majority seems to be prone to gambling, despite the risk involved. However, risk is more acceptable than actually incurring a loss. This indicates a pattern of continued gambling in order to recover losses incurred by high risk which was in it self incurred by gambles to begin with.

Now that there are two clearly distinguished sub-groups, we can contrast both groups’ answers with how they choose to allocate their assets in question 10. The question gives alternatives for investing an unspecified sum of money. The alternatives are to invest mainly in either stocks, funds, bonds or an unspecified mix thereof. In the scenario, choosing alternative one indicates a high propensity for risky investments while alternative two, index funds indicates a moderate propensity and the third option of bonds a low propensity. The fourth alternative is a way of compensating for the possibility that the respondent prefer some unmentioned mix of the different assets. This way, the data does not become skewed by the lack in alternatives. Contrasting these answers with the already found patterns may be used to reveal understanding of the underlying process.

Sub-group 1 was defined by question 9 and 7 to as a large majority prefer risky alternatives. The answers’ of the sub-group was distributed in the following way: 19 of the 33 chose the first alternative, the riskier stock-portfolio. 7 selected the moderately risky alternative of index funds; 2 respondents selected the conservative approach of bonds. 4 respondents from sub-group 1 picked the fourth alternative.

Simple mathematics shows that the riskiest alternative is the most popular, with a slight majority of the respondents choosing it over the other less risky alternatives. The distribution however, shows a significant portion favoring alternative one, the riskiest. Shown this way, alternative one has almost three times as many picks as the second most popular alternative. This indicates further rationality in sub-group 1; the group prefers risky investments. Out of the 19 respondents that exhibits high propensity to risky investments 13 are between the ages of 22 and 25, the final 5 were evenly distributed among the other age categories. This is a possible indication of the relationship between preferred level of risk and
age. Business students ages twenty-two to twenty-five are in the beginning of their financial lives, and should have the possibility to recuperate any incurred losses in time. Furthermore, the discussed group should not be as financially well-endowed so that taking risky position could have a major effect on the personal economy of the individual. Only a very small part of the respondents picked the fourth none-of-the-above style of answer, indicating that almost everyone was satisfied with the alternatives provided.

In sub-group 2 the answer distribution for question 10 was more evenly spread over the alternatives. Approximately half of the sub-group, 8 out of 18 preferred the same risky investments as the majority of sub-group 1. However, almost as many selected the fourth alternative, to choose their own mix of assets. 2 respondents of the sub-group chose the second alternative and only 1 the third.

The fact that the highest risk alternative and the optional alternative got almost as many picks indicates further irrationality in a sub-group that has already displayed inconsistency. Sub-group 2 seems to display overconfidence in its ability to pick investments. It prefers not to sell an investment with a currently decreasing value, and wants to make its own mix of investments as well. The group does not seem to have a general level of preferred risk, instead decisions give the impression of being made spontaneously, without any consistent deciding factors.

Concluding this part of the analysis, we can see that there are in fact two very different subgroups of the sample, with different preferences. Sub-group 1 is, in this line of analysis, characterized by consequently making highly risky choices. This is a valid type of selection, and the fact that it is done consequently indicates that it is taken rationally based on the same values independently. Sub-group 1 could be called risk-takers, and it contains a subgroup of even higher takers of risk. Sub-group 2 however does not display the same, or much of any, level of consistency. Decisions are taken seemingly at random, which means that they are based on irrationality (Figure 1).

![Figure 12 - Decision Tree 1: Risk and Loss Aversion](image-url)
5.2.2 Measuring Trading Rationality and Analysis approach

Another test of the rationality of the respondents in the sample is to correlate the connection between the answers given and the answers that would normally be considered correlated for those two questions. In question 5 respondents were asked to rank the influence of several different components on their trading decisions. The first and second of these components were the importance of fundamental and technical analysis. The hypothesis posed is that how important the use of these two approaches can be controlled by other questions in the questionnaire.

The premise for a conclusion in testing the rationality is that a person that states fundamental analysis as the main form of decision-making for trading should also have stated that the company’s area of activity was important. Consider if a respondent do consider fundamental analysis as a large and important part of his/hers trading-process but does not care about the area of activity. That could then indicate that the respondent do not understand the concept of fundamental trading, acts irrational or does not understand one or several of the questions given in the questionnaire. Similarly, a respondent that lists technical analysis as important to his or hers decision-making should have a higher than average trading frequency. Since that is an essential part of technical analysis, or so is assumed in this test.

Using the same sorting method as when testing risk and loss aversion, it is found that 31 of the 53 respondents say that they use fundamental analysis exclusively or to a large degree. Of those, only 16 consider the company’s area of activity to matter to a large degree or exclusively. Following this reasoning only half the respondents that apply fundamental analysis to their investment strategies seems to have a rational approach. From this the conclusion can be drawn that the respondents are misinformed about the traditional practice of trading or do not understand the question as intended. This could be proof of irrationality.

Testing the correlation between question 5, first alternative, and question 6 using the non-parametric Spearman’s correlation coefficient fails to find any significant result (Table 1). IFA stands for Importance of Fundamental Analysis and AoB stands for Area of Business, the latter was named area of activity in the questionnaire.

<table>
<thead>
<tr>
<th>Correlations</th>
<th>IFA</th>
<th>AoB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman's rho IFA Correlation Coefficient</td>
<td>1.000</td>
<td>-.095</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td>.513</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Spearman's rho AoB Correlation Coefficient</td>
<td>-.095</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.513</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 1 - Spearman's Rho: IFA-AoB

Answers were translated from non-parametric to numerical in an ascending fashion depending on the importance given by the respondent. From our sample no correlation with significance could be found. This is possibly due to a combination of question misunderstandings...
tanding and respondent irrationality. A fourth possibility is that the importance of area of activity is interpreted as a question of ethics.

The other main trading approach, technical analysis, was contrasted against question 3 – the frequency of trading. In the sorting process it is revealed that 15 out of the original 53 respondents consider technical analysis as a large degree or exclusive part of influence on their decision-making. Out of those 15, 8 respondents stated a trading frequency of four to seven or more times per year, which was the highest possible frequencies available. Technical analysis is mainly concerned with making profit out of predicting trends and temporary fluctuations on the market. It is assumed that in order to effectively apply technical analysis it is necessary to trade frequently. Based on that assumption, there are signs of irrationality in the discrepancy between the importance given to technical analysis and the frequency of trading stated.

When testing the respondents for a correlation between the importance given to technical analysis and the frequency of trading state no significant correlation could be proven (Table 2). To test the Spearman correlation coefficient was calculated and tested. Possible reasons behind the lack of correlation and the answers could be that respondents exhibit an interest for the method but lack the time or capital necessary to fully employ it.

<table>
<thead>
<tr>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman's rho</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>FREQ Correlation Coefficient</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

Table 2 - Spearman's Rho: TA-Freq.

5.2.3 The connection between experience and frequency

One of the purposes of this paper is to illustrate the process underlying the chosen populations’ habits and the influencing factors. One such of item of interest is to find whether or not trading habits are connected. A Spearman’s correlation coefficient is determined and tested using SPSS using the following numerically coded input as ranks (Table 3, Table 4);
Table 3 - Trading Frequency

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid 1</td>
<td>14</td>
<td>26.9</td>
<td>26.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>23.1</td>
<td>50.0</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>11.5</td>
<td>61.5</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>38.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4 - Experience

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid 1</td>
<td>23</td>
<td>44.2</td>
<td>44.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>32.7</td>
<td>76.9</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>19.2</td>
<td>96.2</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>3.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The total number of observations N is stated as 52 since one observation was not included in the test. The omitted observation lacked answer to one of the two observed variables.

Table 5 states that the Spearman’s rank correlation coefficient equaled 0.28 for trading experience and trading frequency. This was found to be significant with a confidence level of 95%, so the null-hypothesis is rejected: there is proof of a correlation. Approximately a little less than a third of the trading activity performed by respondents in the sample can be accounted for linearly due to their previous experience.

Table 5 - Correlation: Trading freq. - Experience

<table>
<thead>
<tr>
<th>Spearman's rho</th>
<th>Tradingfreq Correlation Coefficient</th>
<th>Experience Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tradingfreq</td>
<td>1.000</td>
<td>.89(*)</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.038</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
As the test states, respondents must not necessarily trade more because a greater amount of experience, but it does have a significant effect. This shows correspondingly in the test, experience is partly correlated to trading activity. It has already been established that there is no significant correlation between the preferred method of trading and the stated preferred behavior. Despite this, there is a connection between experience and trading frequency, indicating that confidence or the perceived ability is derived from heuristics and previous activities.

### 5.2.4 Herd behavior

Question 8 deals with a fictive scenario in which the respondent is face to face with the pressure of the herd. The individual has been observing a specific company for some weeks and are just hours away from purchasing stocks in the company. Before buying the stock the respondent goes to lunch with her friends and together they discuss the company. The friends do not agree with the statement that the company would be a good investment. Now the respondent is faced with the challenge of ignoring the values and opinions of the herd, what will she do?

Figure 13 - Decision tree 2: Herd Behavior

The intention of applying this specific question was to connect it to one of the tools in question 5, namely to which extent the respondent takes the advice of family and friends in consideration in investment decisions. As the above figure (Figure 2) illustrates, the majority of the individuals in the sample either postponed or refrained from purchasing the stock after discussing it with friends. Out of 51 individuals 33 would not purchase the stock, at
least not without further analysis of the company. Only 18 stated that they would ignore the input of their friends. Approximately two-thirds of the sample agreed that the inputs of friends would affect their actions in this specific decision making process. Special notification must be made of the fact that 2 of the respondents have been excluded; 1 did not respond on question 8 while 1 did not respond on question 5.

Out of the ones which answered that they would either postpone their decision until further analysis or refrain from purchasing, the absolute majority answered that they did listen to family and friends to at least some extent. The ones which answered that they listened exclusively to their family and friends would obviously reconsider their decision. However those which answered that they did not listen to what their friends and family had to say at all would rationally follow through with their decision. Despite this there are 5 individuals which answer that they would reconsider even though they have stated that they do not listen to their immediate surroundings. Possible explanations for this are few; they might have just filled in the questionnaire in a hurry without putting much thought into their answers. Another possible explanation would be that they are not aware of the extent to which their surroundings influence them. In their own minds they may be certain that they act as independent individuals, whereas in reality they are attached to the herd. An absolute majority of those which did not follow through postponed their decision, only 4 of the respondents would refrain from investing in the company after discussing it with friends. It should also be noted that the answers in the final sorting shows tendencies of a normal distribution. The slight asymptotic distribution shown can possibly be attributed to small sampling size. If this is true it indicates that in this decision scenario people tend to regress to the mean in their choices. The outlying extremes are correspondingly rare.

![Figure 14 - Herd Behavior](image)

The second segment of the sample was the ones which answered that they would follow through and purchase the stock despite the negative opinions from their friends (Figure 3). Within this segment, those that answered that they did not listen at all to their family and friends are easily explained. If you do not listen to the opinions of your friends in investment related decisions, you are probably going to follow your original plan no matter how much they oppose it. A similar reasoning can be carried regarding those which answered that they listen to some degree. One might listen to what they have to say but it is probably not going to drastically affect ones decision. However those which followed through despite the fact that their friends and family hold a large influence on their investment related decisions may be harder to explain.
Figure 15 - Follows through and listens to friends & family

Figure 4 connects the answers from the respondents which stated that they would follow through with their answer on to what extent they listen to their friends and family. The people who would follow through on the investment plans should also be the same people who put no or little emphasize on the opinions of their family and friends. On the other hand there might be several reasons why the respondents have answered in this manner. Firstly they might separate between friends and family. Some might listen to family members to a higher extent than to their friends, while others might do the opposite. Some of the respondents might have family members with a good insight in certain listed companies or certain industries and therefore take those family members opinions in consideration. Secondly some respondents might even prefer that their direct surroundings disapprove their investment decisions. This line of reasoning focuses on the connection between the popularity of a stock with its price. The more popular a stock is the higher will the price for the very same be, and the more unpopular a stock is the lower will its price be. Whenever the stock of a company which one deems to be a good investment is unpopular it will be traded at a discount. The respondent has evaluated the company, deemed it to be undervalued, and when discussing it with friends noticed that the herd is of the belief that the stocks are more or less worthless.
6 Conclusion

The purpose of this paper was to investigate the sub-population of students interested in trading and investment within the population of students at Jönköping International Business School. The intention was to create an understanding through previous research in behavioral finance combined with findings generated through this paper.

The conclusions that can be drawn by the subsequent findings of this paper are all connected to the actual population. The sample was taken in a business school, full of students’ currently undergoing education and gathering experience, both with regards to investments and life.

The youth of the population is evident in how risk is accepted. One sub-group was observed to take the riskier alternatives when possible, which maximizes potential return. Traditional investment theory dictates that the longer time period before the money is needed and thus the time available to recuperate losses, then the higher should the risk taken on be.

In the other sub-group, which did not always chose risk; no other rationality could be discerned satisfactorily. Choices were sometimes inconsistent and opposite of previous choices made. This is probably due to the already established fact that the sample is in fact students. Since they are students they are still learning and forming opinions and behaviors of their own.

It was statistically proven that there was a significant correlation between trading experience and trading frequency. This indicates that the more experience a member of the sampled population accrues, the more frequent becomes the trading. It could be a sign of confidence born out of previous experiences, which is the phenomenon called heuristics. A small percentage of the sample displayed strong confidence levels at the time of sampling.

The majority of the respondents at the time of sampling displayed herd behavior. When faced with a decision where the herd advised against the choice of action that the respondent had previously decided upon, they changed their mind. In fact, two thirds of the entire sample did as they were advised by their peers.

The low confidence levels, the herd behavior and the frequently irrational choices can all be explained by the sampled population. As students in a dynamic environment the respondents do not possess a complete set of decision-making principles. Rather, they are currently studying in order to develop a rational way of approaching decisions, or more specifically decisions relating to finance and economics. Thus, their behavior can be considered logical – they are not yet expected to act rationally. This observation can be termed “student behavior”.
7 Reflections and further studies

This research paper has delivered some indications on the behavior of student investors. Nevertheless its limited scope makes it inadequate to make assumptions regarding students in general. It would be of interest to look further into this topic to see if general patterns can be detected in the behavior of the students. In order to achieve this, further studies has to be conducted to provide sufficient depth. One suggestion would be to conduct similar studies on other schools and with larger samples. Could the same behavioral patterns be detected?

Not only would other geographically located samples provide insight, but a wider collection and separation of different schools. While we can expect business students to display at least some financial literacy as an effect of business school, would the same be true of engineers, teachers and health majors? It would certainly deepen the knowledge on the subject of students’ in general financial behavior.

This paper found that a general student behavior could not formally be defined, but that the behavior displayed tendencies assumed to originate from on-going education. If that assumption is true, could a change in the behavior be observed with accumulation of experience? Possibly, students currently enrolled in business school compared to graduates with working experience would generate a more nuanced picture of the “students” behavior.

Additionally, no differentiation in this paper was made with regards to the focus of respondent’s studies. Theoretically, one could ask for students within finance and accounting to be able to rationally make decisions with regards to investments. Does the same hold true for students focused on entrepreneurship, marketing and management, or organization and leadership?

Another suggestion for further studies would be to look more into student’s attitude towards risk. In our research, students illustrated tendencies towards a relatively high tolerance of risk. Can the same behavior be observed in students in general or is this something specific for the students at JIBS?

In the end, the paper was able to create a first insight into the reasoning as it applies to behavioral finance of business students.
References


Appendices

7.1 OMX Stockholm All share index development

![OMX Stockholm All Share Index Development](image)


7.2 Questions 3 and 4: Experience and Frequency

**Trading Frequency**

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**Experience**

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7.3 Questions 5a and 6: Spearman’s Rho

The approach described in the method was used to code answers numerically and test for a correlation. Two observations were omitted due to lack of answers.
The total observations input coded numerically;

### Importance of using Fundamental Analysis

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### Importance of Area of Business

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### 7.4 Questions 5b and 3: Spearman’s Rho

The approach described in the method was used to code answers numerically and test for a correlation. Two observations were omitted due to lack of answers.

The total observations input coded numerically;

### Technical Analysis

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### Frequency of Trading

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<td>Total</td>
<td>51</td>
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</tr>
</tbody>
</table>
7.5 Frågeformulär

1. Kön/Ålder

Ange kön och ålder

2. Vad är din huvudinriktning på din nuvarande utbildning?
   - Ekonomi
   - Juridik
   - Teknik
   - Media/kultur
   - Hälsovård
   - Pedagogik
   - Annat

3. Hur ofta handlar du med aktier?
   - mindre än en gång om året
   - 1-3 ggr/år
   - 4-7 ggr/år
   - 7+ ggr/år

4. Hur länge har du handlat med aktier?
   - 0-2 år
   - 3-5 år
   - 6-10 år
   - 10+ år
5. Hur viktiga är följande verktyg för dina investeringsbeslut?

<table>
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<tr>
<th></th>
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</tr>
</tbody>
</table>

6. Till hur stor del tar du hänsyn till företagets verksamhet när du väljer att investera i en specifik aktie?

- Inte alls
- Till viss del
- Till stor del
- Uteslutande

7. I samband med en allmän nedgång på börsen sjunker värdet på en av dina investeringar utöver den genomsnittliga nedgången. Om inga ekonomiska faktorer till synes har förändrats, vad gör du?

- Du behåller ditt innehav och inväntar en upptägande trend
- Du avvaktar för att se hur aktiekursen utvecklas
- Du säljer ditt innehav för att undvika ytterligare förluster


- Du avstår från investeringen efter diskussionen med kompisarna
9. Du har just vunnit 1000kr som en deltagare i ett tv program och erbjuds ytterligare en chansning. Denna chansning har följande villkor; det är 50% sannolikt att du vinner 250kr och 50% sannolikt att du förlorar 250kr. Tar du chansningen?

☐ Ja
☐ Nej

10. Du ska skapa en ny portfölj och har följande alternativ till förfogande;

- Aktie A med en förväntad avkastning på 15%, +/-20%
- Indexfond B med en förväntad avkastning på 7%, +/-10%
- Räntebärande statsobligationen C med en garanterad avkastning på 3%.

Vilket av följande alternativ väljer du?

☐ En majoritet i aktie A, resten fördelat på övriga alternativ
☐ En majoritet i fond B, resten fördelat på övriga alternativ
☐ En majoritet i obligation C, resten fördelat på övriga alternativ
☐ En valfri fördelning av de tre alternativen.
7.6 Questionnaire

1. Age and Gender

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<th>Age</th>
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</thead>
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<tr>
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</table>

Choose your age and gender

2. What is your major area of study?

☐ Business/Economics
☐ Law
☐ Engineering
☐ Media/Culture
☐ Healthcare
☐ Education
☐ Other

3. How often do you trade with stocks?

☐ less than one time a year
☐ 1-3 times per year
☐ 4-7 times per year
☐ 7+ times per year

4. For how long have you been trading with stocks?

☐ 0-2 years
☐ 3-5 years
☐ 6-10 years
☐ 10+ years
5. How important are the following sources for your investment decisions?

<table>
<thead>
<tr>
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<th>To a small degree</th>
<th>To a large degree</th>
<th>Exclusively</th>
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<tr>
<td>Analysts</td>
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</tbody>
</table>

6. To what degree does the company’s area of activity matter when you decide whether to invest or not?

- Not at all
- To a small degree
- To a large degree
- Exclusively

7. In conjunction with a general stock market decline the value of one of your investments decrease more than the average decline. If no fundamental factors seem to have changed, what do you do?

- You keep your position, waiting for the market to turn
- You await further development of the stock price
- You sell your investment to avoid further losses

8. You’re about to go to lunch. After the lunch you’re planning on purchasing stocks in a specific company which you’ve been keeping an eye on for the past few weeks and now deem to be attractively priced. During lunch you discuss the stock with your friends, but to your surprise they advise against purchasing it. After lunch you log on to your online broker, what do you do?

- You refrain from making the investment after your discussion with your friends
You postpone the investment in order to further develop your analysis of the company

You stand by your decision and purchase the stocks

9. You have just won 1000SEK during a TV game show and are offered to take part of a new gamble. The conditions for the gamble are as follows; you have a 50% probability of winning 250SEK and 50% probability of loosing 250SEK. Do you accept the proposition?

☐ Yes

☐ No

10. You are about to create a new portfolio and have following alternatives at hand;

* Stock A with an expected return of 15%, +/-20%
* Index fund B with an expected return of 7%, +/-10%
* Government bond C with a guaranteed return of 3%

Which of the following alternatives would you prefer?

☐ A majority of the portfolio in stock A, the rest allocated amongst the other alternatives

☐ A majority of the portfolio in index fund B, the rest allocated amongst the other alternatives

☐ A majority of the portfolio in government bond C, the rest allocated amongst the other alternatives

☐ A free distribution between stock A, index fund B and government bond C.