Gender difference in financial decision making

- A quantitative study of risk aversion and overconfidence between the genders

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Abstract

There is evidence that Sweden is a very gender equal society, actually number one in the world. The economic participation and access to the financial market between men and women is nearly equal and women hold similar proportions of total wealth in stocks and bonds. We have conducted a quantitative study to investigate differences in risk aversion and overconfidence between genders when it comes to financial decisions. Our problem formulation is:

To what extent does gender affect an individual’s financial decisions, are women more risk averse?

We also aim to address the following question:

Are women less overconfident than men?

The purpose of this study is to determine if gender can really affect financial decisions. We investigate the relationship between risk aversion, gender and overconfidence. We have conducted this study with a positivistic view and used a deductive approach starting to conduct a literature review of theories and build the thesis from this point. We relied largely on modern portfolio theory which has been expanded by researchers examining individual utility (risk theory or risk aversion) and behavioral aspects of investment behavior including overconfidence.

The data for the study have been collected through surveying a very narrow target population, explicitly students at Umeå University. We used a strata sample with four strata units divided by gender and level of study in order to receive a wider perspective of the population; the units matched the proportion of students at Umeå School of Business. To measure the statistical difference between the genders we have used a statistical Chi² test.

From the empirical findings and the analysis we have been able to draw some conclusions from our study. We found that there is a tendency among women to have a higher degree of risk aversion than men. This implies that women would take a lower risk when managing an investment portfolio. We also could conclude that men and women are similar in their level of confidence when it comes to financial decisions.

Key words: decision making, financial behavior, gender perspective, risk aversion and overconfidence
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Introduction

In this introductory chapter we will give the reader a brief précis of the choice of subject, the problem background and the purpose of the study. We will provide the reader with some basic information about gender differences in financial decision making. In the end of the chapter limits of the study will be presented to the reader.
1.1 Choice of subject

We have been intrigued in several ways by literature, media and friends in terms of the choice of gender and financial decision making, which are the main points of focus for this study. We had from the very beginning intended to undertake research about the Swedish pension system, and then we narrowed that down to gender and financial decision making since making a decision in the Swedish pensions account varies with gender. We narrowed the subject further to check for two specific widely discussed traits, that is risk aversion and overconfidence. Because we believe these two traits are interconnected with gender and financial decision making.

1.2 Problem background

In 2007 Sweden ranked number one in the list of the most gender equal countries in the world followed by Norway and Finland (Global Gender Gap 2007). The economic participation of women and men are nearly equal, which enhances the conditions for growth and personal development. In regard to participation in the financial markets, both men and women have equal access to investment in financial instruments. Furthermore, women hold similar proportions of total wealth in stocks and bonds. (Christiansen, Joensen and Rangvid 2009)

The general opinion is that women tend to choose less risky investments once they invest in the financial market. The most predominant findings in the academic literature seems to show that women are more risk averse than men; see e.g. Jianakoplos and Bernasek, (1998) and Sundén & Surrette (1998). Women have been found to trade less aggressively than men implying that women are less overconfident than men; see e.g. Barber and Odean (2001). All other things being equal, conservative investment strategies results in less retirement income on average than more aggressive strategies. The issue is that women have a greater life expectancy than men (www.scb.se). Hence, it is of relevance to understand that one possible outcome is that women will be likely to have accumulated less wealth despite longer periods of wealth consumption.

Closely related to the opinion that women are risk averse is the belief that women are less confident in their financial decisions. Overconfidence can be defined as the systematic overestimation of one’s decisions and the precision of one’s knowledge (Dittrich, Guth and Maciejovsky 2001). Gender differences in overconfidence have been found in numerous studies; see e.g. Graham, Stendardi, Myers and Graham (2002) and Barber and Odean (2001). The main problem with women being less overconfident in financial decisions is that they are more likely to avoid financial issues in general and that women are more likely to postpone financial planning (Graham, Stendardi, Myers and Graham 2002: 18). One can say that the more a person trades the more likely the individual is to be confident with financial decisions (Barber and Odean 2001).
Brokerage firms and banks are often very interested in the investment behavior of their clients. A study commissioned by a major Swedish online brokerage firm found that women in general take less risk than men in their portfolios. They also found that women are thought to be more long-term oriented with their investments because men tend to buy and sell more often than women (www.nordnet.se). However, according to a study by one online bank, the trend seems be in reverse because women are willing to take more risk in order to get higher returns and apparently that trend has been climbing steadily since 2006 (www.avanza.se). This can be interpreted as a vague signal that woman are becoming more active in the world of investing. Thus, women are developing more financial confidence through more experience.

1.3 Problem formulation

In accordance to the above-mentioned information and our own interest we form our research question:

To what extent does gender affect an individual’s financial decisions, are women more risk averse?

We also aim to address the following question:

Are women less overconfident than men?

1.4 Purpose

The purpose of this study is to determine if gender can really affect financial decisions. We find that little study has been carried out in Sweden in terms of risk aversion and overconfidence in relation to genders and financial decisions making. We investigate the relationship between risk aversion, gender and overconfidence. This study is aimed to contribute to this field through surveying a very narrow target population, explicitly students at Umeå University Business School.

Our main purpose is to gather knowledge about how gender affects financial decisions. We also aim to:

- Explain gender differences towards decision making
1.5 Limitations

We have chosen to limit our research to gender differences among students at Umeå School of Business. The sample has been divided into strata units that match the proportions of students at USBE; we have four strata units in our sample female students at undergraduate level, female students at advanced level, and male students at undergraduate level and male at advanced level. We have included both Swedish and international students in our sample but not divided these into certain strata units. A major limitation of the study, as a consequence of this choice, is that our study may not be readily generalized to the population as a whole. Also, given the fact that we did not break down our strata units further, for example, into students in each year of studies, no assertions can be made about the influence their education has on the decisions of students.

Within the subject of financial decisions we investigated two theories - risk aversion and overconfidence. We decided not to investigate how external factor like the media would affect the participant’s decisions. We also chose to ignore behavioral factors such as; herding and anchoring. All of these may have contributed even greater understanding of the variations between genders but were outside the scope of our study.
Chapter 2

Previous Research

The goal of this chapter is to provide a general discussion of the literature reviewed. The review was necessary in order to see what had been done in this field and to assist us in the development of our research questions. We discuss what other studies have found, their major findings and their conclusions.
2.1 Literature review

We find that this thesis belongs partly to the behavioral finance research area since we desire to look at how gender, risk aversion and overconfidence may affect the decision making of the individual in terms of their choice of financial investments. When we reviewed previous research within the same field of study we found that researchers have conducted various studies regarding the investment decision of individuals in all kinds of investments. In order to limit the review, we focus on research that studied how gender affects the decision making of the individual in financial investments. We find that their methods of approach do find their way into our research, helping us to develop our topic further.

In 1998 Sundén & Surrette investigated the connection between gender and the investment choice of an individual who has the possibility to choose their own retirement plan. The study found that gender and marital status affect how individuals choose to allocate their assets in their pension account. Moreover, the study suggested that age and education did not seem to affect the asset allocation decisions of the individual. Bajtelsmit, Bernasek and Jianakoplos (1999); and Powell and Ansic (1997) also examined how gender affects asset allocation in retirement pension accounts. The study found that there are relative gender differences in the allocation of investments in retirement plans. Their final conclusion was that women exhibit a greater relative risk aversion when choosing the allocation in their retirement savings account.

Other studies have found that women display greater risk aversion in a wide variety of activities, including financial decision making (Hintz, McCarthy and Turner, 1997; Jianakoplos and Bernasek, 1998; Bajtelsmit and Bernasek, 1996). However, it is difficult to answer the question of gender differences since researchers can only observe the outcome of decisions rather than the decision making process and that ultimately gender differences could be attributed to gender discrimination and individual preferences (Bajtelsmit and Bernasek, 1996). On the other hand, Schubert, Brown, Gysler and Brachinger 1999 found that women, under controlled economic conditions, generally do not make less risky financial decisions. This is clearly contradicting previous research; however they suggest that differences from previous research may be due to how differences in male and female opportunity sets are framed. In addition to the contradictory findings, Sundén 2004 found that married women tend to take more risk in their premium pension portfolios than unmarried woman.
There is evidence that suggests that gender plays an important role in an investor’s perception of risk. In addition, male investors display tendencies to simplify information, thus ignoring relevant aspects of investment information (Graham, Stendardi, Myers and Graham 2002; Barber and Odean 2001). The individual’s risk perception functions as a mediator in the decision making process.

The characteristics of the individual affects the decision making indirectly, especially any earlier financial experience the individual has had (Sitkin & Weingart 1995; Schubert, Brown, Gyler and Brachinger 1999).

Benartzi and Thaler in 2001 investigated that relationship between individuals that invested aggressively or conservatively in the allocation of assets within their pension account. They find that more females are likely to adopt a naïve diversification strategy in their retirement savings fund. In the same year, Bernasek and Shwiff (2001) found that women were more conservative than men when allocating assets in their retirement account. They conclude that gender differences are a significant factor in explaining individual investment decisions.

Individuals are often optimistic about the accuracy of their judgments and knowledge. Several researchers find that individuals are in fact overconfident about their judgments and knowledge regarding financial decisions (Klayman, Soll, Vallejo and Barlas 1999; Dittrich, Guth and Maciejovsky 2001).

Overconfidence is a characteristic found in both men and women; however, women have a tendency to display less overconfidence about a financial judgment than do men (Bengtsson, Persson and Willenhag 2004; Beyer and Bowden 1997; Ricciardi and Simon 2000; Barber and Odean 2001; Powell and Ansic 1997). There seem to be implications related with the lower confidence and the increased risk aversion of women for when they invest. Graham et al (2002) implied that one major disadvantage is the forgone chance of a high return and a high reliance on low return investments. Alternatively though, the tendency toward lower overconfidence can lead women to be more thoughtful and informed investors as they are more likely to ask more questions than men do and to consider all relevant investment factors.

We can conclude that researchers over time have indicated that significant differences occur in decision making depending on the gender of the individual. Moreover, one of the researchers found a contradictory view of gender in terms of investment decision making. There seems to be tendencies for women to be less confident in their decisions than men. Our intention is that our study may be able to contribute to this field by showing whether these differences exist at an early stage in an investor’s development.
Chapter 3

Methodology

In this chapter we will describe the research methods used in our study. In the beginning of the chapter we will go through preconceptions and also our research assumptions. Furthermore our research strategy, methodological assumptions and perspective will be presented to the reader. Finally we will discuss the secondary sources and any criticism we have of those sources.
3.1 Preconceptions

In this part of our thesis we will describe any previous knowledge and experience the authors had about the subject under investigation. This knowledge is important to declare for the reader in an early stage of the thesis as it could have an impact on the direction of the study. This could have an effect on how the reader will understand the background and interpretation of the study (Johnsson Lindfors, 1993:76). We will divide these types of knowledge into two parts the theoretical and the practical parts. The theoretical part consists of educational background and previous studies, while the practical background explains work related and other forms of experience.

The pre-understanding of a subject could be explained by previous experiences in life. This could be explained by the person’s practical, social and academic experiences. The author’s prior knowledge could be divided into primary and secondary knowledge, the primary knowledge consists of personal experiences such as work or social activities, and the secondary knowledge is explained by previous learning, studies and other literature inputs. (Johnsson Lindfors, 1993:76)

Both of the authors have studied 3.5 years in the international business program at Umeå School of Business. Through our education we have gathered business related knowledge in management, marketing, accounting and finance. Apart from studies in business we have conducted some studies in economics and statistics. Both the authors have extended experience from studies abroad, one from USA and the other from China. Our previous studies will give us a wider understanding of concepts and theories related to our thesis work.

During financial courses at Umeå School of Business we have discussed theories about risk and risk aversion. This has led us to a greater understanding of our field of study. Work and previous life experience is widely separated among the authors. One of the authors has grown up in El-Salvador and later moved to Sweden, where he gained work experience from the financial sector. The other author grew up in Sweden, but has lived in USA, Austria, China and South Africa. He has previously worked with marketing research.

3.2 Research assumptions

In order to fulfill the objective of our study we have had to conduct a literature review to gain theoretical knowledge in the field of study. In the literature review we read earlier studies and articles related to behavioral finance. The literature review was of substantial use for us, as it helped us to create a well-established problem formulation and to select a theoretical approach.
Within the research of social science several different approaches could be used to conduct an investigation of a subject. In the deductive approach the researcher starts with previous studies and theoretical constructs and later tries to determine whether his/her results can be generalized and offer support for the selected theoretical framework. The standard alternative usually mentioned as distinct from the deductive, is the inductive approach. Here, observation is meant to lead to generalizable principles, i.e., the researcher starts to conduct empirical research and theories are later drawn from their observations. (Johnsson Lindfors, 1993:55)

We realized in an early stage that a deductive approach would be most beneficial for our type of study. From the literature review that we carried out in the beginning of our study, we found that many other studies with a similar subject matter have used a deductive approach. In a deductive study we could start with already existing theories about financial behavior, with a gender perspective. As with many such studies Bernasek and Shwiff 2001; Bernatzi and Thaler 2002; we used a survey to collect data to be analyzed.

Critics of the deductive approach argue that when observations are made with a theoretical perspective in mind, that perspective distorts reality. There is a risk, it is suggested, that the theory under development may not work in practical situations (Johnsson Lindfors, 1993:55-56).

3.3 Research Strategy

For a researcher, under the social science umbrella, different methods for collection of empirical data are available. The most commonly used are; the quantitative and the qualitative method. In both methods the researcher tries to collect empirical data to develop a greater understanding of the subject under investigation.

In the qualitative method the researcher is more concerned to achieve knowledge from a few numbers of participants. Words expressed by the participant are in focus and interviews are most commonly used. (Bryman and Bell, 2007:28-29) In the quantitative method the main focus is on a large sample of respondents. Many observations are collected to draw conclusions that could be generalized beyond the single case to a larger population. (Bryman and Bell, 2007:169)

Through our literature we found out that the most common approach for data collection within this type of discipline is the quantitative method. Therefore we have decided to use the same method in our study; this gives us the opportunity to process data from a large number of respondents and the possibility to generalize the results for the population. Since we use a deductive approach and a positivistic view the quantitative method is preferred (Bryman and Bell, 2007:28).
We are aware of the drawbacks associated with quantitative methods, but we believe a 
quantitative method is more suitable for our problem formulation, purpose and collection of 
data. The data collected will be quantified; this means that the answers from the 
questionnaire will be converted into numerical numbers. Quantification will give us the 
possibility to compare the results in our study with previous studies in the same field. This 
method will make it feasible for us to present the results in of our data collection in graphs 
and tables, which will give a clear and understandable layout. (Ejvegård, 1996:34)

3.4 Methodological assumptions

Positivism advocates a naturalistic epistemological study to understand the social reality, in 
which the researcher tries to prove something objectively (Bryman and Bell, 2007:16). 
Johnsson; argues that positivism and the hermeneutic perception of knowledge are two 
views from different schools either of which can be applied by a researcher during a study. 
These perceptions of knowledge explain the perception a researcher has toward the context 
of their study. (Johnsson, Lindfors, 2003:23)

One school of thought, the positivist, suggests that researchers should strive towards an 
objective view, this in order to avoid a biased result that could not be used by others 
(Ejvegård, 1996:17). For a researcher to be able to generalize the results to a larger 
population, an objective view is preferred. During our thesis work we have tried to have an 
objective view and have tried not to influence the results of our study. We are aware that 
this has not been possible at all times. When we created the questionnaire for our research it 
was difficult to stay objective and not influence the questions asked.

3.5 Perspective

The perspective from which we studied our problem acted as a lens that filtered our 
observations. The choice of perspective is a conscious choice that the researcher has to be 
aware of during the investigation. The choice of perspective is usually based upon tradition, 
i.e. on what other researchers have done previously. This is due to the fact that knowledge 
is built iteratively, each researcher standing on the shoulders of those who have gone 
before. However, it should be noted that the theoretical construct chosen has a significant 
impact on the results.

Researchers studying the same problems from different perspectives could reach 
contradictory results (Halvøresen, 1992:37-38). We believe that a clarification of the 
perspective is necessary. Our purpose was to investigate how gender influences financial 
decisions.

From our literature review we came to the conclusion that decision making and risk 
aversion between genders was a bit unclear and something we wanted to conduct further 
research on.
3.6 Secondary Sources

Primary data was collected to allow for an empirical assessment of our problems. Secondary data, collected through various sources of articles, books and webpages, was used initially, to provide a wider perspective studying an area where we knew little. The secondary sources used allowed us to apply the deductive method in order to derive hypotheses to be tested. The results presented by secondary sources can also be used to complement those we obtained from our own research.

In our research we have gathered information and literature from articles, books, webpages and previous studies related to our subject of choice. To collect articles we mainly used databases such as Business source premier and JSTOR.

Google scholar has been used as a search engine to find articles. When we used Google scholar we looked for articles that had been cited frequently in other articles to ensure that they had a high degree of peer acceptance. We used the reference lists in articles related to financial behavior and to gender perspectives to find further studies, this has helped us and been rewarding.

When we searched for articles about financial behavior we used some key words, i.e. decision making, financial behavior, gender perspective, risk aversion and overconfidence. These key words have generated many articles from which we gathered further knowledge.

3.7 Criticism of Sources

The reliability of different sources has been discussed by Ejvegård (1996:59) who created criteria for assessing secondary sources; these included authenticity, independence and timeliness. Authenticity describes whether the material in an article or book is real or is counterfeit. Counterfeit material cannot be used as a reference. Independence describes whether the material in an article originates from the use of primary or secondary sources. Primary sources, he suggests, should be ranked higher than secondary sources. Researchers should always try to find the original source for development of knowledge. Timeliness means that the researcher should use newer sources published more recently, in preference to older sources. (Ejvegård, 1996:59-61)
Chapter 4

Theoretical Framework

In this Chapter we explain the theories behind this study. The classical perspective, modern portfolio theory is useful in explaining rationality when making financial decisions. A discussion of modern portfolio theory is followed by a thorough explanation of risk and how it impacts the decision making of individuals. Risk aversion and overconfidence will be explained as behavioral factors that are displayed differently between females and males.
The theories chosen became the tools of analysis of the empirical data collected. The theories discussed were found to fit the scope of the study. Risk and return led us to portfolio theory developed by Markowitz. Risk alone led us to behavioral finance, which can be useful to classify the investor’s behavior towards investments, an area that is not identified in modern portfolio theory. The computations of return and risk are not relevant for this study thus they have not been treated in any detail. In that same context, formulas have been left out in order to keep the theory as comprehensible and simple as possible.

4.1 Modern Portfolio Theory

In 1952 Markowitz wrote the “Portfolio Selection Theory” where he questioned the hypothesis that individuals strive only to maximize their returns. He emphasized the weight investors put on risk. The proper choice among efficient portfolios depends on the investor’s willingness and ability to assume risk. Thus with greater risk the investor expects a greater level of likely returns (Markowitz 1952:6-7). When individuals choose assets they are assumed to be risk-averse and income maximizers, this means that people will request a minimum risk for a given level of return (Howells and Bain 2008:186-187).

Modern portfolio theory is concerned with the assembly of an optimal portfolio for risk-averse investors. Before Markowitz developed his theory, the general assumption was an optimal portfolio was constructed by five different securities and that was called diversification. However, Markowitz showed that it was more complex than that and he suggested taking into consideration the correlation between the securities in the portfolio (Curtis 2004:16).

In addition, modern portfolio theory states that the degree of risk to which investors are exposed can be reduced through diversification of assets in the portfolio (Howells and Bain 2008:187-192). However, diversification does not reduce total risk, it reduces unsystematic risk, and therefore it is important to pay attention to security specific risk. The more securities gathered by the investor the more chance the investor has to eliminate unsystematic risk, as presented in Figure 1 below. As a result of the possibility to diversify, a risk-averse investor would do everything possible to diversify away specific risk, but the market risk will always remain (Howells and Bain 2008:191).
Modern portfolio theory (now referred as MPT) has its limitations; the most consistent is that the theory is only useful under certain conditions. For example, the MPT assumes continuous pricing, free and stable societies, free markets and as discussed earlier, investors are risk averse and by definition this implies that they are rational and wealth-maximizers (Curtis 2004:17). The perfect investor does not exist and that implies that investors are not always rational and thus assuming that investors are completely rational is simply incorrect (Curtis 2004:17). However, as long as the market has sufficient players to balance off any irrationality the market is assumed to operate as if all in investors were rational. This proposition is supported by the existence of arbitrage (Rubinstein and Stephens 2001:16). Swisher and Kasten (2005) suggest that the MPT is wrong because it does not construct efficient portfolios but completely inefficient ones. They assert that risk is not equal to the standard deviation because “risk is just an emotional condition” and can therefore not be calculated (Swisher and Kasten 2005:74). The lack of consideration of human behavior and the overestimation of the stock market has been the point of focus for critics of MPT (Vanden Spiegel 2005:392).

Despite the criticisms of MPT, the theory is widely accepted and it is a reasonable basis for construction of portfolios. The application of MPT reduces unsystematic risk through selecting securities returns that are not positively correlated with each other. Markowitz suggested three simple steps for selecting an efficient portfolio which will not be explained in detail.

1. To distinguish between efficient and inefficient portfolios
2. To find within a portfolio a combination of likely returns and the uncertainty of returns
3. Chose the efficient portfolio

(Markowitz 1952:91)
4.1.1 Risk

We believe that risk will affect the investment decision of the individual and therefore it is of importance to discuss it more thoroughly. Risk is one of the most important features considered by individuals when evaluating an alternative course of action such as choosing a career or making a financial decision (Gonzach 2001:353). Despite the central function of risk in decision making, there seems to be a relative cloudiness around the meaning of risk (Gonzach 2001:354). Risk can be defined as the probability that the actual return may differ from the expected return, as the expected return increases so does the level of risk (Howells and Bain 2008:186-187).

Volatility is another definition of risk and it is mainly known as a short-term occurrence. Thus it is can be defined as the fluctuation of financial assets in the short term. Though, for long-term investors volatility can be interpreted not just as risk but as the opportunity to achieve better returns. (Bernstein 2005:58)

Risk is closely related to the required returns of securities as you can see below in Figure 2. If the risk of a security increases then the expected return of that security also increases (Howells and Bain: 186-187). Swisher and Kasten (2005) explain that investors see risk in different ways: risk of loss, the risk of underperformance and the risk of failing to meet one’s goals. Risk is part of the human concerns of everyday life. Investors are worried about downside deviation of returns not upside deviation, thus a valid definition of risk must describe the investors actual fear of bad outcomes (Swisher and Kasten 2005:76).

![Figure 2 Relationship between risk and return](www.investopedia.com)
It is important for the investor to know what risk is and how it functions in order to make a good assessment about an investment. Investors can investigate and assess the risk involved with securities in order to assemble an optimal portfolio. However, the investor should keep in mind that the risk reduced in a diversified portfolio is only the unsystematic risk, the systematic risk always remains at the same level (Markowitz 1952:91)

4.2 Behavioral Theory

Conventional portfolio theory tries to explain how financial markets perform and it assumes that investors are rational; the field of behavioral finance questions this assumption. Behavioral finance attempts to show how the investor behaves and it can therefore be a respectable compliment to modern portfolio theory. The following theories are just a couple of the several occurrences’ studied within behavioral finance. They show that people base their behavior on several physiological factors such as; fear and greed.

4.2.1 Utility and risk aversion

Utility theory assumes that people commonly have a diminishing utility of wealth. This basically means that individuals are risk averse. The measure of the utility of wealth is not the main issue of this research; however we found it to be of importance to mention how it is related to risk aversion. The utility function has a curvature that is based upon the amount of wealth the individual has. That is, each dollar has greater value to the poor than to the wealthy. The utility of wealth curve helps clarifies why an individual is willing to take risks when he has less wealth and risk averse when wealthier. In addition, when individuals are given alternatives involving risk they choose the one which provides the largest expected individual utility (Friedman and Savage 1948:303). For illustration see Figure 3.

The general view of gender and risk aversion is that women appear to be more risk averse than men in investment decisions in equivalent circumstances (Graham et al 2002:17). Graham defines equivalent circumstances as those where males and females are given similar alternatives regarding the risk of several investments. When faced with one alternative having a given outcome with certainty, and a second alternative with the same expected value that is a pure gamble, a risk-averse person would choose the guaranteed outcome rather than to gamble (March and Shapira 1987:1404).

A risk-averse individual would prefer the relatively low risk asset and is willing to sacrifice expected return in order to decrease the variation of the asset’s possible outcomes. In
addition, a lower risk preference could lead the individual to a stronger desire for advisors as well as a higher degree of anxiety in financial decisions (Powell and Ansic 1997:607).

Risk aversion is closely related to the risk tolerance of investors in the sense that those individuals that tend to be more risk averse are less tolerant of financial risks (Mulino and Chai 2008:21). Powell and Ansic (1997) investigated risk tolerance and risk aversion and their relation to gender. The research found that females have a lower tolerance for risk regardless of whether the subjects were familiar with the tasks or not. Increased risk aversion may lead to lost opportunities for high returns and often an increased dependency on low investment returns (Graham et al 2002:18).

4.2.2 Overconfidence

We believe that people may display overconfidence about their financial decisions. The general notion is that people actually tend to show overconfidence about the accuracy of their knowledge and judgments (Klayman et al 1999:217). Confidence in investment decisions is strongly affected by gender. Women tend to show a lower degree of confidence than men (Powell and Ansic 1997:608).

Overconfidence can either increase or decrease depending on the complexity of the task and the uncertainty perceived with the task. Overconfidence increases with the complexity...
of the task and overconfidence decreases when the perceived uncertainty is high (Dittrich et al 2001:474). To Illustrate:

*The explosion of the space shuttle Challenger should have not surprised anyone familiar with the history of Booster Rockets - 1 failure in every 57 attempts. Yet less than a year before the disaster, NASA set the chances of an accident to 1 in a 100 000. That optimism is far from unusual: all kinds of experts, from nuclear engineers to physicians often display overconfidence in their suggestions.* (Ricciardi and Simon 2000:3)

Investors, like everyone else, can forget and can fail to learn from past errors, such as bad investment or financial decisions. The failure to learn from past financial decisions strengthens the overconfidence problem because individuals keep being overly-optimistic about their financial decisions (Ricciardi and Simon 2000:4). Women with fewer tendencies toward overconfidence in investment decisions usually display an increased risk aversion compared with men (Graham et al 2002:17). In addition, the lower tendency toward overconfidence could lead to more thoughtful and informed investors since women with less confidence in financial investments would be likely to consider all information available and to ask more questions (Graham et al 2002:24).
Chapter 5

Data Collection

This chapter is devoted to describing the ways we have collected our data for our survey. We will firstly describe primary data sources and our research design and sample. We then provide information on the construction of the survey, the choice of a survey, access to respondents and the data process. Finally ethical considerations and a general criticism of primary data sources are presented. This chapter is intended to generate a greater understanding for the practical method of this thesis.
5.1 Primary data and research design

When a researcher starts a new investigation, a collection of secondary data is most commonly reviewed to gather knowledge about the subject; this is data that already exists. Most researchers then gather primary data or new information more closely linked to their actual research. Collecting primary data can be done through various methods; we have decided to use a survey to gather knowledge and to investigate behavior patterns among individuals of different genders. This material has been used to describe the chosen behavioral factors related to gender differences among students at Umeå School of Business. In our study we will use a self-contained questionnaire to gather primary data.

5.2 Sample

In our study we decided to investigate risk aversion and overconfidence between different genders. When we decided on the population for this study we had to consider problems associated with sample size. A sample size that is too small could generate many sampling errors; with a larger sample size precision could be gained which would make the study more notable (Bryman and Bell. 2007:195). However, there are many difficulties in gathering a very large sample. Time and cost to conduct research with a very large sample has to be closely regarded by the researcher. (Halvorsen, 1992:96) These factors have to be taken into consideration before choosing a sample method.

The population of this study will be the student body of Umeå School of Business; from this population we could draw a reasonable sample size. We have decided to use a stratified sampling method; this may allow us to generalize the answers from this study at least to other similar population groups. In a stratified method the population is divided into smaller strata units, depending on known variables, these could be gender and level of study. The proportions between the strata units, should be the same as the proportions within the population, this is called a proportional sampling (Halvorsen, 1992:99).

We have decided to investigate a population that deviate from the average citizen. Our population consists of a group of youth that is well-educated and should be more familiar with financial and economic subjects. This population in under great influence and in the developing stage of their financial behaviors.

In our study we have decided to use a sample of 100 students which is almost 7,5% of the student population of USBE in the spring of 2010. The total amount of student is 1336 out of these 594 are registered on an advanced level and 225 are women. 742 are registered on general level and 323 are women. These students will be divided into 4 different strata units divided by gender and level of study. We will match these proportions in the sample to the actual proportions of the student body at USBE.
The proportions of the student body of USBE could be seen in Table 1 above. From this total population we will collect 24 surveys from females at the undergraduate level and 17 from the graduate level, as well as 31 surveys from male at the undergraduate level and 28 from the graduate level. The accuracy may be affected by the fact that these students are, in some sense, homogenous but by drawing students from all levels and with different genders we believe we have countered this problem to some extent.

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Collected in our study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>43,5%</td>
<td>56,5%</td>
<td>55</td>
</tr>
<tr>
<td>Graduate</td>
<td>38%</td>
<td>62%</td>
<td>45</td>
</tr>
</tbody>
</table>

Table 1 Proportion of students at USBE

5.3 Construction of survey

To gather a more general understanding of financial decision making between genders we have decided to construct a questionnaire to be assessed using quantitative methods. The primary data that will be gathered for this research will be measured and analyzed using SPSS, this software allow us to conduct a Chi²-test. We use the test to measure if the differences between the genders are statistically significant. From this we will draw our conclusions.

When constructing a survey many issues have to be taken into consideration, surveys usually start with easy questions for the respondent. The purpose with this is to increase the possibility that the respondent will fill out the survey. Time is always an issue; the survey should not be too long and time consuming otherwise the number of non-respondents would be likely to increase (Keller, 2005:144). We started our survey with simple questions about the respondent’s gender and risk awareness. The questionnaire also contains more complex and theoretical questions. Our main intention was to construct a short survey to reduce the non-response rate, but at the same time to provide us with detailed data. The survey is only 3 pages long. Biased answers usually occur when questions are not stated in a clear and comprehensible way (Johnsson Lindfors, 1993:112). To reduce the risk of misinterpretation we have decided to use multiple choice questions, these types of questions would be more beneficial for analysis with SPSS. The questions are written in a simple language, to not influence the respondent’s answer. We have avoided using open ended questions since these types of question are time consuming for both the respondent to answer and the researcher to assess.

The layout of the survey is constructed to be as clear as possible with as much open space around each question as possible in order to make it both attractive and easy to understand.
We have positioned the questions in a vertical way with lots of space between the questions, and highlighted the questions to give a clear overview of what is being asked.

In the beginning we have added a short introduction to explain the purpose of the study for the respondent. The questionnaire is written in English. A pilot study was conducted to evaluate the quality of the questionnaire we used. 6 people to perform the study. We decided to use some other students that also wrote their thesis on C and D level. The pilot study gave us suggestions for further development of the questions; this could reduce the probability of misinterpretation of questions during further research. After the pilot study we made some minor changes in layout and rephrasing the questions. The questionnaire was finally sent to our supervisor for approval.

5.4 Choice of Questionnaire

The purpose of the questionnaire is to distinguish general tendencies related to the theories underpinning our research. We examine gender differences through presenting respondents of both genders with identical questions. The questions in the questionnaire were selected from previous surveys presented in the literature. Preceding surveys within this field were based on a sample of 10 to 20 standardized questions. For this thesis Grable and Lytton (1999) was used to develop the structure of the questionnaire. All of the questions were modified to fit the target group and to make the questionnaire more up to date. The final questionnaire contained 12 survey questions.

Risk aversion: The main goal of the risk aversion portion of the questionnaire is to capture how much risk the individual is willing to take. Most of the questions that assess risk aversion include a hypothetical monetary gain that the respondent must gamble with. Respondents who gamble over the guaranteed return should be considered risk takers (Grable and Lytton 1999). Question 2, 4, 6, 7, 9, 12 are based to assess the risk taking behavior of the individual.

In question 2 we want to examine how each individual views themselves - either as a high or a low risk taker. This question could be linked with later questions concerning risk aversion. Question 3 determines risk aversion in investments with zero information given about each investment’s expected return, the respondent have to choose from their own experience and knowledge. The main difference between questions 6 and 7 is that no money could be lost only gained in question 6 while in question 7 there is a risk that the individual will not keep any money. We believe that respondents are more risk averse when there is a possibility to lose money therefore we think that the risk taking in question 6 will be higher than in question 7.

In question 9 we want to determine the respondent’s ability to handle a loss of money to see if this loss will affect their risk aversion. The last question in the questionnaire determines risk aversion within investments. In this question the distribution between high, medium and low risk is known to the respondents. This question should be closely linked to question 2 since all the available information is given.
**Overconfidence:** Overconfidence is a characteristic found in both men and women. (Bengtsson, Persson and Willenhag 2004) A simple way to investigate overconfidence among respondents is to ask if they are better than average on something that they all have in common (Grable and Lytton 1999). Through general assessment questions we try to capture the overconfidence level within the surveyed individuals. This should give a fair indication of the level of overconfidence that exists among females and males as females are expected to be less overconfident than males (Bengtsson, et al 2004; Beyer and Bowden 1997; Ricciardi and Simon 2000). Question 5, 8, 10 and 11 were created to assess overconfidence among the respondents.

Question 5 and 8 are both connected to perceived performance of an individual. We would like to find out if an individual with a high level of confidence also desires to take a high risk in investments. In question 10 and 11 we want to explore how the respondent’s view their own abilities within a certain task compared to others; a high answer indicates that the respondent is confident of his/her abilities.

**Financial experience:** Respondents with more financial experience should tend to be less risk averse than those without or with less financial experience (Klayman et al (1999); Dittrich et al (2001)). In question 3 we try to assess the level of financial experience of the respondents. We believe that individuals with a deeper knowledge about the financial market would lead to higher risk taking in financial decisions.

To each answer alternative in the questionnaire a weight is given, where the higher weight represents low risk aversion (high risk) and lower weight represents high risk aversion (low risk). The weights range from 1 (lowest risk) to 4 (highest risk) depending on the amount of alternatives. The weights represent the possible score to get on the questions.

**5.5 Non Response**

Non-response is likely to occur when a quantitative research is conducted, especially using a questionnaire. Common errors that occur include misinterpretation of questions or that some participants are not willing to complete the survey. We decided to use a questionnaire in English this could cause some bias since students misunderstood the questions or did not want to answer a questionnaire in English.

When respondents decide not to participate or not to finish the survey these respondents we increased the population to be able to still receive 100 surveys. In our survey we had a non-response rate of 5 people this include two respondents that did not finish the questioner and three who did not want to participate due to time concerns. The total population of our survey will therefore be 105.
5.5 Access

One of the most difficult tasks for a researcher is to gain access to the social environment that is relevant for the data that will be gathered. (Bryman and Bell, 2007:444) To motivate respondents and make them willing to participate in the survey could be a problematic issue. When conducting a survey a very short time is spent with each respondent, but confidence has still to be built up. Information about the purpose, result, use of data and anonymity should be presented to the respondent at an early stage, to increase the willingness to participate among respondents. (Johnsson Lindfors, 1993:136)

In our survey we presented a short introduction to the respondent with information regarding the study presented in the letter head of the first page of the survey. We believe that respondents that were well informed were more eager to contribute and participate in the survey.

We have based our survey on students attending Umeå School of Business; since we both attend this school we are familiar with this setting. This could increase our ability to gain access to this environment. Before we handed out our survey we were concerned that many students would not be able to participate, the students might not have time due to the fact of thesis work and lectures.

For us to add some random variability to our survey we have decided to hand out the survey through-out three days, with three different time spans each day. Furthermore, we have decided to move around on campus to avoid collecting surveys from only one group of students. We will collect surveys from Lindell, University Library, Universum, Tornet and around the microwaves. Many students were positive and helpful when answering the survey. We believed that the students felt that they contributed towards a goal and therefore took part of the survey. We have expected the respondents to give us trustworthy and serious answers, hence give us a good access.

5.6 Data processing

When all the data from our survey was collected we started to prepare the data for further processing in SPSS. We divided the survey results into two groups, one with female respondents and one with males. The surveys were encoded with a numerical number to avoid confusion in the analysis of the data. SPSS is a statistical program for data analysis used to help us to draw conclusions and statistical results from the data we have gathered. These conclusions are presented in visual graphs and tables that we have used in further analysis. With help of SPSS we have conducted Chi²-tests to determine if there is a significant difference between the expected frequencies and the observed frequencies in our data, in one or more categories. We have determined the expected values for this test from prior knowledge which was drawn from our literature review. For the chi-square test a 95% confidence interval will be used.
5.7 Ethical considerations

Before conducting research some important ethical principles have to be considered. When conducting a survey four criteria have been developed to be closely followed by the researcher. These four criteria are respondent freedom, autonomy, honesty and privacy (Brenkert, 2009: 68). We will discuss these principles and how we observed these in our survey.

The respondents to a survey should never be forced to participate this would be an intrusion on their freedom or autonomy. Participants would not feel comfortable and could give answers that are not trustworthy and cause bias in the results (Brenkert, 2009:69). When we conducted the research respondents were asked if they were willing to participate, no one was pressured to participate or to complete the survey if they refused to do so.

Honesty is an important factor when conducting research. Participants should be well informed about the purpose of the study and why they have been chosen to be questioned. This principle is sometimes called informed consent (Brenkert, 2009:70). In order for us to avoid misunderstandings we have introduced a short introduction in the beginning of the survey to inform participants about the aim of the study.

Invasion of privacy should always be avoided by a researcher. The researcher should try to enforce confidentiality and not share the information from a single participant with others. The shared information should only be presented as generalized conclusions from a population as a whole (Brenkert, 2009:71). Our survey was constructed so that the participants remained anonymous, when we performed the survey we decided to step back when a participant filled in the survey to not invade their privacy.

5.8 Criticisms of primary data

During the data collection we received many comments about the survey, many people thought it was interesting and would like to see the results of the study. That the survey was easy to answer and not too time consuming was also widely commented upon. We could have used more questions to gain a deeper analysis, but we believed that this would have increased the length of the survey in a negative way which could have decreased the response rate. We have chosen to use English in our survey to avoid any mistranslations in the study; this could have had some implications since most of the respondents did not have English as their mother tongue. To avoid misunderstandings of questions we have only used simple words in the questionnaire. The student respondents in our sample are all university students who are used to English; we therefore consider that the language choice would not have any negative implications for the results. We believe that we got the information needed for our analysis through the survey and that there was a well-established connection between the survey and the purpose of the study.
Chapter 6

Empirical Findings

This chapter will solely present the empirical findings of the study. We present the results with the help of graphs in order to provide a clear overview and a better understanding of the differences between male and female participants.
6.1 Empirical findings

The empirical findings are presented in illustrated diagrams from SPSS. We have chosen this type of presentation in order to create a clear overview that will make it easy for the reader to follow the results. Furthermore, the distribution for each diagram will be explained. Chi²-tests of significance have been used to evaluate differences in responses between the genders.

Question 1

Gender distribution among respondents

In the beginning of the survey we concentrated on asking general questions about the respondents, in order to give us an overview and to make them comfortable. The first question we asked concerned gender. We have chosen a stratified sample that consists of 41 female and 59 male students at Umeå School of Business. This matches the distribution within the population. We decided to collect all 100 surveys.

Figure 4 Gender distribution
Question 2

In the second question the individuals were asked to choose the risk perception that expressed best how they feel towards risk. Clearly, there seem to be a tendency among male respondents to see themselves as high risk gamblers. 24.4% of all men, that responded to the survey, answered that they see themselves as high risk gamblers, whereas only 2.4% of the in the surveyed women reported that they felt they were high risk gamblers.

How would you describe yourself as a risk taker?

Figure 5 Risk description

The most chosen alternative between men was that they felt that they were eager to take risks after completing sufficient research. 54.2% of the surveyed men reported that they would be eager to take risks after completing sufficient research, while 43.9% of women reported that they would be eager to take risk after completing sufficient research. In the next alternative, 20.3% of men stated that they would approach risk in a careful way. On the other hand, 51.2% of women reported that they approached risk carefully. Lastly, 2.4% of women saw themselves directly as risk averse while none of men even chose this alternative.

For this question, the $\chi^2$-test showed that the responses between the genders are significantly different from each other at a 95% level of confidence. The critical value is 7.815 and the calculated $\chi^2$ value is 51.360. The $\chi^2$ values are higher than the critical value, which confirms that the responses are significant.
Question 3

The final introductory question in our survey concerned how often the respondents have invested money in the financial market. This question is important since regularly making investments implies that the respondent have prior knowledge that could affect their answers on future questions.

How frequently do you invest in the financial market?

![Figure 6 Investment Frequency](image)

We have divided the answers from this question into two graphs one for the female respondents and one for the male respondents. From the graphs we can distinguish a difference in investment frequencies between the genders. Out of 59 respondents 13.6% of the male students have answered that they never invest any money in the financial market; for the same question 36.6% of the female students have never invested in the financial market. Male students who have invested regularly in the financial market were as high as 32.2%, while for female students this was number was only 7.3%. Between these two answers we can see a huge difference between the genders in which male students are more eager to invest in financial markets than their fellow female students. The percentage of students that had invested sometimes in the financial market was very similar between the genders 54.2% of the male students and 56.1% of the female students gave this answer.

The Chi$^2$-test showed that the responses between the genders are significantly different at a 95% level of confidence. The critical value is 5.991 and the calculated Chi$^2$ value is 21.140. The Chi$^2$ values are higher than the critical value, which confirms that the responses are significant.
Question 10

In this question we wanted to measure overconfidence among the respondents, respondents who are confident with themselves and with their decisions tend to take a higher risk when it comes to financial decisions (Graham et al 2002).

How do you consider your ability to get along with other people?

![Pie charts showing the distribution of responses among genders]

None of the male respondents have given the answer that they consider themselves to be below average while 4.9% of the female respondents have given this answer. For male respondents the distribution between about average and above average is almost the same: 50.8 have answered about average and 49.2 above average. For the female participants 39% answered about average while 56.1% answered that they consider themselves to be above average.

The Chi²-test indicated that the genders have answered with a significant different at a 95% confidence level. The critical value is 5.991 and the calculated Chi² value is 42.140. The Chi² values are higher than the critical value, which confirms that the responses are significant.
**Question 4 and 5**

In question the individuals were given four different levels of risk to chose from. The first alternative in question four was if the respondent would invest in government bonds. The second alternative was to save in a bank account. The third alternative consisted of investing in ten different mutual funds and the last alternative was to invest in the Swedish stock market. That is, each category represented an increasing level of risk with a potential commensurate increase in return. Question five explored the overoptimistic level of the individuals when planning their personal economy. The alternatives given were, Bad, Good and Excellent.

**Q4. You have received 100 000 SEK with one condition; you have to invest the money. Which of the alternatives would you choose?**

**Q5. How do you consider your skills at planning your personal economy?**

![Figure 8 Skills/Investment Decision Male](image)

The male participants that reported feeling good about how they planned their personal economy was 42.4%. 20.3% of these individuals selected to invest in mutual funds and 22.1% chose to invest in the stock market.

The remaining 57.6% responded that they had excellent skills when planning their personal finance. Of these 3.4% would save the money in a bank account, 11.9% would save the money in mutual funds and 42.4% would be willing to invest in the stock market. In total,
3.4% of the male participants chose the bank account as a form to save the money, 32.2% would invest the money in mutual funds and 64.4% would invest in the stock market.

The female participants were given the same choices as the male participants in both question four and five. Here we found that out of 17.1% that reported that they had bad skills in managing their personal finance, 4.9% would invest in government bonds. Similarly, 4.9% would save the money in a bank account, 4.9% would invest in mutual funds and 2.4% would invest in the stock market.

68.3% of the female respondents believed they possessed good skills in planning their personal economy. Out of those 68.3% respondents, 4.9% would invest in government bonds. In addition, 14.6% would save in a bank account, 31.7% would invest in mutual funds and 17.1% would invest in the stock market.

![Figure 9 Skills/Investment Decision Female](image)

**Figure 9 Skills/Investment Decision Female**

The remaining 14.9% self-reported to have excellent skills when planning their economy. Out of that 14.9%, 4.9% would save in a bank account and 9.8% would invest in the stock market. In total, 9.8% of the female respondent would save in government bonds, 24.4% would save in a bank account, 24.4% would save in a bank account, 36.6% would invest in mutual funds and 29.3% would consider investing in the stock market.

For question four and five, the Chi²-test showed that the gender differences are significant at a 95% level of confidence. The critical value of question four is 7.815 and the calculated Chi² value is 52.080. The critical value for question 5 is 5,991 and the Chi² 31.820. The Chi² values for both questions are higher than the critical values.
Question 6

In this question we measure the risk aversion for the respondents, they were told that they had received 10’000SEK and had a chance to win more money and there were no risks for the respondent to lose any money. Three alternatives were presented 50% chance to win an extra 10’000 and 50% to not get anything extra, 25% chance to win an extra 20’000 and 75% to not get anything extra and finally 10% chance to win an extra 50’000 and 90% to not get anything extra.

Assume you are given 10’000 SEK and the chance to earn additional money, which of the following alternatives would you choose?

![Figure 10 Earn Additional](image)

The results from this question are presented in two graphs one for male students and one for female students. In this question we can see a clear differences between the two genders in which male students are more eager to take a higher risk than female students. The proportion of male students that choose the lowest risk was 55.9% among female students this proportion was 80.5% which is almost 25% higher than for male students. The answers for the medium risk alternative was more closely related than high or low risk, 23.7% of the male respondents gave this answer and 17.1% of the females. In the highest risk alternative we can see the greatest difference between the genders. The highest risk alternative was chosen by 20.3% of male respondents but only by 2.4% of the female respondents.

The Chi²-test showed that the genders are significant at a 95% level of confidence. The critical value is 5.991 and the calculated Chi² value is 48.980. The Chi² values are higher than the critical value, which confirms that differences are significant.
**Question 7**

In this question risk aversion is the main priority, the question is similar to question six but with one difference. In this question the respondent faces the risk to lose all the money; therefore we believed that the respondents would be more risk averse in the question compare to question six. They were given 20’000 SEK and had to choose one of three alternatives, 75% chance to get an additional 10’000 SEK with a 25% chance to lose all the money, 50% chance to get an additional 20’000 SEK with a 50% chance to lose all the money and 25% chance to get an additional 30’000SEK with a 75% chance to lose all the money.

**You are given 20’000 SEK with a condition that you have to gamble, which of the following alternatives would you choose?**

![Figure 11 Gamble](image)

**Figure 11 Gamble**

In this question 40.7% of the male respondents and 58.5% of the female respondents have chosen the least risky alternative. For both genders this rate is lower than in the previous question which indicates that the respondents are more willing to take a high risk, for the chance to win more in return opposite from what we had expected. The medium risk alternative has been chosen by 44.1% of the male and 36.6% of the female. Twice as many respondents have chosen the medium risk alternative in question seven than in question six; this is true for both genders. The most risky alternative was chosen by 15.3% of the male respondents and 4.9% of the female respondents, for male respondents this is lower than in question six, but for female this is more than twice as high.

The Chi²-tests indicated that the genders are significantly different at a 95% confidence level. The critical value is 5.991 and the calculated Chi² value is 23.180. The Chi² values are higher than the critical value, which confirms that differences are significant.
Question 8 and 9

Question eight focuses on how optimistic respondents are about their general performance. Three alternatives were presented to the respondents below average, about average and above average. Whilst question nine tries to capture how the surveyed individuals feel towards risky situations. In question nine, the respondents were faced with a loss of 1000 SEK, three alternatives were provided here as well, keep you loss without further action, 50% chance to win 500 SEK and 50% chance to lose an additional 500 SEK and 25% chance to win 1000 SEK but with a 75% chance to lose an additional 1000 SEK.

Q8. How do you consider you performance at USBE?

Q9. Imagine you have just lost 1000 SEK in a game and had the chance to choose one of the following alternatives, which would you choose?

![Figure 12 Performance/Lost Male](image)

Out of the 5.1% of the male respondents that considered themselves to have a below average performance, 1.7% of them chose the safest alternative and 3.4% chose the medium risky alternative. 54.4% of all male respondents reported to perform about average, whereas 27.1% chose the safest alternative, 18.6% chose the medium risk alternative and 8.5% selected the high risk alternative.

The remaining 40.7% of the male respondents reported to perform above average, whence 22% selected the safest alternative in question nine. 10.2% picked the medium risky alternative and 8.5% selected the high risk alterative. In total, 50.8% of all male participants...
selected the safest alternative, 32.2% chose the medium risky alternative and 16.9% picked the high risk alternative.

For male respondents, the Chi-Square test showed that the differences in the responses are significant at a 95% level of confidence. The critical value is for question 8 is 5,991 and the calculated Chi-Square value is 20,780 for men and the critical value for question 4 is 7,815 and the Chi-Square 11424. The Chi-Square values are higher than the critical value, which confirms that the differences are significant.

![Figure 13 Performance/Lost Female](image)

The female participants who reported that they performed about average were about 73.2%, 36.6% of these selected the safest alternative and 36.6% chose the medium risky alternative. Lastly, out of the 14.6% that reportedly performed above average 7.3% selected the safest alternative and 7.3% picked the medium risky alternative. In total, 48.8% selected the safest choice in question nine, 46.3% chose the medium risk alternative and 4.9% picked the high risk alternative.

For question eight and nine, the Chi²-test showed that the gender differences are significant at a 95% level of confidence. The critical value of question eight is 5,991 and the calculated Chi² value is 42.980. The critical value for question nine is 7,815 and the Chi² 23.420. The Chi-Square values for both questions are higher than the critical values.
Question 11 and 12

Question eleven measures the confidence level of the respondents. Three alternatives were given for respondents to choose between from below average, average and better than average. Question twelve was an attempt to find tendencies that show whether the respondents chose a higher level of risky investments. In question twelve, the respondents are asked to invest 250 000 SEK; three alternatives were given. The first alternative was a portfolio with 75% low risk, 15% medium risk and 10% high risk. The second alternative was a portfolio with 50% low risk, 30% medium risk and 20% high risk. Lastly, the third alternative provided a portfolio with 25% low risk, 20% medium risk and 55% high risk assets.

Q.11 How good are you at speaking English compared to other students at USBE?

Q.12 You have inherited 250 000 SEK with a condition that you must invest in one of the following alternatives, which one would you choose?

![Figure 13 English Skills/Inherited Male](image)

5.1% of the male respondents reported that they were below average when speaking English, whereof 3.4% of them selected the medium risky portfolio and 1.7% chose the high risk portfolio.

62.7% of the male participants thought they were average when speaking English. Of these, 47.5% would invest in the medium risk portfolio and 15.3% selected the high risk portfolio.
The remaining 32.2% of the male respondents reported that they were better than average when speaking English. 11.9% of them chose to invest the inherited money in the medium risk portfolio and 20.3% selected the high risk portfolio. In total had 62.7% of the male respondents selected the medium risk portfolio and 37.3% would invest the inherited money in a high risk portfolio.

![Figure 13 English Skills/Inherited Female](image)

12.2% of the female participants reported that they were below average when speaking English. Of these, 4.9% chose to invest the inherited money in the low risk portfolio, 4.9% would invest in the medium risk portfolio and 2.4% selected the high risk portfolio. Out of the 41.5% of all female respondents that self-reported to be average when speaking English, 12.2% selected the low risk portfolio, 24.4% would invest in the medium risk portfolio and 4.9% chose the high risk portfolio to invest their money.

The remaining 46.3% of female respondents answered that they were better than average when speaking English. 24.4% chose the low risk portfolio, 19.5% selected the medium risk portfolio and 2.4% would invest the money in the high risk portfolio. In total, 41.5% selected the low risk portfolio, 48.8% chose the medium risk portfolio and 9.8% would invest the money the high risk portfolio.

For question eleven and twelve, the Chi²-test indicates that the gender differences are significant at a 95% confidence level. The critical value of question eleven is 5,991 and the calculated Chi² value is 30.020. The critical value for question nine is 7,815 and the Chi² value is 24.080. The Chi-Square values for both questions are higher than the critical values.
Chapter 7

Analysis and conclusion

The intention of this chapter is to tie up the theoretical framework that consists of risk aversion and overconfidence with the empirical findings from the data collection. The analysis will follow the same order as the empirical finding to create a clear overview for the reader. Finally the conclusions of the study will be presented. The purpose of this chapter is to discuss the results of the empirical findings.
The purpose of this study is to determine if gender can really affect financial decisions. The research within this field has been narrow and mostly conducted abroad. We limited this study to merely students at Umeå School of Business. In the study we investigated the relationship between risk aversion, overconfidence and gender.

Our research questions are:

- To what extend does gender affect an individual’s financial decisions; are women more risk averse than men?
- Are women less overconfident than men?

We have gathered primary data in order to answer our questions about possible gender differences in financial decision making. From the empirical findings we can differentiate tendencies between genders in terms of risk aversion and overconfidence. A statistical Chi²-test has been conducted in order to check for the significance of the differences in the data collected. Specifically, the goal of the statistical test is to declare if the differences between the genders are indeed significant. We applied a 95% confidence level of confidence when conducting the test. According to the Chi²-tests, all differences we observe in the responses are significant.

We can conclude from the empirical findings that:

- In general, men show tendencies to take more risk in comparison to women.
- Overconfidence is found both in men and women. Men show a slightly stronger trend to be overconfident.

7.1 To what extend does gender affect an individual’s financial decisions; are women more risk averse than men?

The findings are connected to previous research that has been conducted within this field, as we have discussed in the literature review. In a study conducted by Bernasek and Shwiff (2001) the conclusion was reached that gender differences are a significant factor when explaining an individual’s decision making. From the study, they found that women are more conservative than men in financial decisions. Barber and Odean (2001) suggested that gender plays a vital role for the individual’s decision making. Our study suggests that gender tends to affect the financial decision of the individual; these tendencies are similar to findings presented in earlier studies.

In the analysis of our results we have found indications that women approach the financial decision in a more conservative manner than men, depending on the situation presented. This can be clearly viewed in the results of question 4. See Figure 8 and 9

The results indicate that a financial decision made by an individual seems to be dependent on the gender of the individual and how they perceive risk. Gonzach (2001) suggests that
risk is an essential feature to be considered when making any type of financial decisions. Each gender evaluates the risk of a financial decision differently. Furthermore, our study shows that men tend to completely disregard the opportunity of a risk free investment implying that a financial decision made by a male respondent would be different to a financial decision made a female respondent.

As we previously discussed, women tend to be more conservative and avoid risk in financial decisions. We can determine from our study that men invest more frequently in the financial market which can imply that this group of individuals has more experience with financial decisions. Women tend to invest less frequently which can indicate that they are not as familiar as men in financial decisions making.

According to Markowitz (1952), individuals are wealth maximizes; this implies that they strive to obtain as much gain as possible from any monetary situation. He also argues that individuals are rational and only make decisions based on all available information. However, the willingness and the ability of the individual to take risk is the ultimate factor that affects their decision (Markowitz 1952:6-7). As we mentioned earlier, men tend to completely neglect the lowest risk alternative and strive towards medium/higher risk alternatives. The opposite tendency was found among female respondents who strive for lower risk alternatives.

Several researchers have consistently found that women are indeed more risk averse than men. Our results show that this specific group of women, business school students, are more risk averse than men from the same population. In general, a greater proportion of women have chosen the lowest risk alternative throughout the survey compared to their male co-respondents. When offered, both men and women tend to choose the medium risk alternative in similar proportions. Whilst, the highest risk alternative is much more preferred by men than by women. The trend identified here is that women, in almost all cases, avoided the highest risk alternative.

We can observe that our results are, to some extent, in line with earlier researchers such as Bernasek and Shwiff (2001). They found that the effect of being a women reduced the percentage invested in stocks, thus they conclude that women were more conservative than men when allocating financial assets. We find that women, to a lesser extent, intended to invest in the stock market. A great proportion of the female respondents would rather invest in savings accounts and mutual funds. Whereas, the reverse trend is found with the male respondents. They focused their investment intentions on mutual funds and the stock market.
7.2 Are women less overconfident than men?

Research regarding overconfidence in relation to gender has consistently shown that women are less confident in their financial decisions. Graham et al (2002) found that women with lower risk taking tendencies would display less confidence in their investment decisions. It is of importance to mention that our results captured the overconfidence level through the use of general assessment questions. We used four different questions, which assess overconfidence similarly. This implied that we can only assess overconfidence as a characteristic within the target group.

We can observe from our results that both men and women show similar tendencies to see themselves better than average compared to other people. The results indicate that woman have chosen in a relatively higher level of confidence on half of the questions. On the other half of the questions women showed a tendency to be just about average whereas men chose to be above average in these questions.

The results indicate that the questions could have had an effect on individual’s responses. We attempted to formulate the questions in a neutral manner and keeping in mind that they would only assess the general opinion of the surveyed individuals. We think that the questions about overconfidence became too gender influenced, which means that they basically perceived the questions differently.

Nevertheless, our results indicate that on half of the questions some women considered themselves to be below average. While none of the men have considered themselves as below average on that half of the questions. On the other half of the questions both men and women have to some extent answered that they considered themselves to be below average, but the proportion for women is relatively larger than for men.

In general, we can observe that the female respondents have considered themselves to be below average to a larger proportion than men. However, the proportion of women that answered below average is a very small compared to the total amount of respondents.

7.3 Conclusion

We have stated in our introductory chapter that the purpose of this study was to determine if gender can really have an effect on financial decisions, particularly among a group of well-educated Swedish youth who have been raised on the concept of equality. We also wanted to see if there was any relationship between risk aversion, gender and overconfidence. The population used was the students of the Umeå School of business. This implies that our generalizations are only applicable to this target group and similar groups in other business schools in Sweden. Our main goal is to gather knowledge about how gender affects financial decisions. With help from the research question and our analysis we could draw some conclusions from our study.
• We can conclude that there is a general indication that gender has an effect on financial decisions. We found that women approach financial decisions in a more conservative manner compared to the males surveyed in this study. We can also conclude that males invest more frequently in the financial market than women. Furthermore, we have found that men display a tendency to completely disregard the opportunity of a risk-free investment.

• When looking at risk aversion, we can conclude that women show an inclination towards being more risk averse than men. This supports the general view that men take more risk and that women are more risk averse.

• In terms of overconfidence, we are not able to conclude that either gender is more confident than the other. We could not see any specific pattern of overconfidence in the results. However, we could observe, to a small extent, that women considered themselves to be below average in terms of confidence questions. Given the obtained results, we think that overconfidence is highly dependent on the situation in which the question is presented.

7.4 Further Research

The study that we have conducted has given us some important insights on two different and controversial aspects of gender differences in investment decisions. However, due to our limitations there are some things that we wish had been analyzed more comprehensively, hence we provide some suggestions for further research within this field.

We think that studying more carefully the other behavioral factors imbedded in finance that may have implications between genders could be of importance. We suggest combining herd behavior and anchoring in order to capture further differences between individuals that may be due to gender.

Moreover, since we only used general assessment questions to evaluate overconfidence, we would like to suggest looking more profoundly into other tools that measure overconfidence behavior more accurately. Thus, measuring overconfidence in a more accurately manner could provide a better perception of overconfidence levels due to gender differences.

7.5 Contributions to this field

The findings of the study contribute more material to the field of finance and gender differences. Our study is supported by other research done within this field and this implies that this study can, to some extent, confirm risk aversion differences due to the gender of the individual. Furthermore, we could not generalize a higher overconfidence level attributed to either gender.
Chapter 8

Research Criteria

In the chapter the questions about how well our study fulfills the quantitative research criteria is to be discussed. The replication, validity and reliability of our study will be discussed to show to what extent our study could be used in other studies.
8.1 Criteria for business research

During an evaluation of quantitative business research three main criteria should be taken into consideration. These three criteria’s are reliability, replication and validity. The concern with reliability refers to whether the results of the study could be repeatable by other researches, i.e. if they would come to the same result. Replication means if it is possible for other researchers to replicate the study and validity evaluates if the study actually measures what it was intended to measure. (Bryman and Bell, 2007:40-41)

8.2 Reliability

For the researcher to get a reliable result is important. Measures should be consistent; if the researcher is not consistent the results will be inaccurate. The reliability of a study is dependent on its measures. If these measures fluctuate between different times this will cause variations that could have a negative effect on the results. Questionnaires are created by the researcher, if these are constructed in an unclear way this would cause a negative effect on reliability. (Ejvegård, 1996:67-68)

We are aware that there are some shortcomings in our study and that it might not be totally reliable. We have not given the respondents an option not to answer a certain question, with this added to the questionnaire we could have received some variations in the result. However, respondents could have left questions blank which would have served the same purpose. In order to avoid bias we decided to conduct a pilot study of our questionnaire, thus increase the reliability and misunderstandings. The questions in the questionnaire have been stated in an as clear as possible way to make it easier for the respondent to understand the meaning of them. If the study would be done in the same context we think that the same results would be the same with little variation, therefore we consider the study to be reliable.

8.3 Replication

To fulfill the criteria of replication it is important that other researcher are be able to replicate or re-do the study. The process that has been used in the study has to be described in detail. This means that the methods that have been used, the construction of the survey and the sample that has been selected must be clearly stated by the researchers. (Bryman and Bell, 2007:41)

We have tried to keep these criteria in mind throughout the study with a focus that the process should be described in as detailed a way as possible. We therefore believe that the study should be replicable for other researchers.
8.4 Validity

For a study to be valid it has to measure what it was intended to measure. Within the field of quantitative research validity could be divided into two different parts: internal- and external validity. The internal validity is mainly concerned with causality or connections between variables. This means that the variables that have been measured should be related to each other and relevant to the study. The external validity measures if the results could be generalized beyond the specific sample of the study. (Bryman and Bell, 2007:41-42)

For us to make our study as valid as possible we have asked our supervisor for help during the construction of the questionnaire, this to make sure that the questions asked were relevant for our purpose. Before the actual survey was conducted we decided to perform a pilot study to ensure that the interpretation of the questions was accurate. We have used a strata sample to ensure that the survey was conducted with the same proportion as the student body of USBE. In order to increase the randomness of our sample we decided to collect the surveys throughout several days and at different hours of the day. With this method we will be able to generalize the findings of our study beyond USBE to other business schools within Sweden and the same age group. We therefore consider our internal validity to be high and the external validity to be medium.
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Appendix 1

Research about financial behavior towards a gender perspective

The purpose of this questioner is to gather data about financial behavior for our C-Thesis in business administration. Our aim is to gather greater knowledge about students’ attitude towards financial decisions, and investigate the differences between genders in financial decision making. The population of the study is students at USBE, and we use a stratified sample. The individual answers gathered will be kept confidential and not shared with anyone, but the authors.

*Please circle your answers*

**Q1. Gender**

- Male
- Female

**Q2. How would you describe yourself as a risk taker?**

- A: A high risk gambler
- B: Eager to take risk after completing sufficient research
- C: Careful
- D: Risk avoider

**Q3. How frequently do you invest in the financial market?**

- A: Never
- B: Sometimes
- C: Regularly

**Q4. You have received 100 000 SEK with one condition; you have to invest the money in one of the following alternatives. Which one would you choose?**

- A: In government bonds
- B: In a saving account in a bank
- C: In 10 different mutual funds
- D: In the Swedish stock market
Q5. How do you consider your skills at planning your personal economy?
   A: Bad
   B: Good
   C: Excellent

Q6. Assume you are given 10’000 SEK and the chance to earn additional money, which one of the following alternative would you choose?
   A: 50% chance to get an additional 10’000 SEK or 50% chance to get 0 SEK
   B: 25% chance to get an additional 20’000 SEK or 75% chance to get 0 SEK
   C: 10% chance to get an additional 50’000 SEK or 90% chance to get 0 SEK

Q7. You are given 20’000 SEK with a condition that you have to gamble, which of the following alternative would you choose?
   A: 75% chance to get an additional 10’000 SEK or 25% to lose all the money
   B: 50% chance to get an additional 20’000 SEK or 50% to lose all the money
   C: 25% chance to get an additional 30’000 SEK or 75% to lose all the money

Q8. How do you consider your performance at USBE?
   A: Below average
   B: About average
   C: Above average

Q9. Imagine that you just lost 1’000 SEK in a game and had to choose one of the following alternatives, which one would you choose?
   A: 50% chance to win 500 SEK and a 50% chance to lose an additional 500 SEK
   B: 25% chance to win 1000 SEK and a 75% chance to lose an additional 1000 SEK
   C: Keep your loss without further action
Q10. How do you consider your ability to come along with other people?
   A: Below average
   B: About average
   C: Above average

Q11. How good are you at speaking English compare to other students at USBE?
   A: Below average
   B: Average
   C: Better than average

Q12. You have inherited 250'000 SEK with a condition to invest in one of the following alternatives, which option would you choose?
   A: 75% in low risk, 15% in medium risk, 10% in high risk
   B: 50% in low risk, 30% in medium risk, 20% in high risk
   C: 25% in low risk, 20% in medium risk, 55% in high risk

Thank you for you participation!