UNIVERSITY OF GOTHENBURG

SCHOOL OF BUSINESS, ECONOMICS AND LAW

Bachelor's project within the Business and Economics Bachelor Programme

The Impact of Financial Literacy on Risk Aversion Between Genders:

A Study on Swedish University Students

Bachelor thesis 15 hp

Authors: Sam Bingmark & Justin Rundcrantz

Supervisor: Gabriela Schaad

Spring term 2024

Abstract

This thesis examines the relationship between financial literacy and risk aversion among young men and women studying at university in Sweden. This is achieved by utilizing a survey methodology, collecting data from 304 university students, and focusing on their financial knowledge and risk attitude. The research aim is to determine if there is a significant difference in risk aversion between men and women and what impact financial literacy may have on this gap. The results reveal that men exhibit lower risk aversion compared to women. However, while holding financial literacy constant, the gap in risk aversion slightly decreases. Furthermore, when financial literacy increases, the risk aversion reduces in both genders. This suggests that financial literacy could mitigate gender differences in financial decision-making. Despite the findings, the regression analysis shows that the interaction term between gender and financial literacy is not significant, which amplifies the necessity of further research. This study contributes to an understanding of how financial literacy influences the relationship between economic behavior and financial decision-making among young adults and genders.

Keywords:

Financial Literacy, Risk Aversion, Gender Differences, Adolescents, Risk Preferences

Table of Contents

1 INTRODUCTION **1**

1.1 BACKGROUND 1
1.2 PROBLEM DESCRIPTION AND ANALYSIS 2
1.3 PURPOSE AND RESEARCH QUESTIONS 3

2 THEORETICAL FRAMEWORK **4**

2.1 RISK AVERSION 4
2.2 PROSPECT THEORY 5
2.3 AMBIGUITY AVERSION (ELLSBERG PARADOX) 6
2.4 THE EVOLUTIONARY THEORY 6
2.5 THEORY RELEVANCE 6

3 LITERATURE REVIEW **8**

4 METHODOLOGY **10**

4.1 METHOD IN GENERAL 10
4.2 QUESTIONNAIRE SURVEY 10
4.2.1 Selection of Respondents *11*
4.2.2 Formulation of Questions *11*
4.2.3 Test of Survey *13*
4.2.4 Data Collection *13*
4.2.5 Principles of Research Ethics *14*
4.3 CRITICISM OF THE CHOSEN METHOD 14

5 DATA **16**

5.1 CLEANING THE DATA 16
5.2 SURVEY RESULTS 16
5.3 PROCESSING AND ANALYSIS OF DATA 20
5.4 DESCRIPTIVE STATISTICS 22

6 EMPIRICAL RESULTS **24**

6.1 REGRESSION RESULTS 24

7 DISCUSSION **29**

8 CONCLUSION **32**

8.1 PROPOSAL TO FURTHER RESEARCH 32

REFERENCES **34**

APPENDIX 1. CONSTRUCTION OF SURVEY 38
Appendix 1.1 ..... *38*
Appendix 1.2 ..... *38*
Appendix 1.3 ..... *40*
Appendix 1.4 ..... *44*
Appendix 1.5 ..... *45*

Table of figures

FIGURE 1: GENDER DISTRIBUTION 17
FIGURE 2: STUDY SUBJECT 18
FIGURE 3: EDUCATION BY GENDER 18
FIGURE 4: TOTAL FINANCIAL LITERACY AMONG ALL RESPONDENTS ON A 10 NUMBERED SCALE (QUESTION 11-20) 19
FIGURE 5: TOTAL RISK AVERSION AMONG ALL RESPONDENTS ON A 10 NUMBERED SCALE (QUESTION 6-10) 19

List of tables

TABLE 1: VARIABLE NAMES, DEFINITIONS AND RELEVANT CODES 21
TABLE 2: TOTAL DESCRIPTIVE STATISTICS 22
TABLE 3: DESCRIPTIVE STATISTICS FOR MEN 23
TABLE 4: DESCRIPTIVE STATISTICS FOR WOMEN 23
TABLE 5: T-TEST OF MEN'S AND WOMEN'S RISK AVERSION 25
TABLE 6: REGRESSION OF RISK AVERSION FOR WOMEN KEEPING TOTAL FINANCIAL LITERACY AS A CONSTANT 25
TABLE 7: REGRESSION OF RISK AVERSION FOR MEN KEEPING TOTAL FINANCIAL LITERACY AS A CONSTANT 26
TABLE 8: REGRESSION OF RISK AVERSION BETWEEN MEN AND WOMEN KEEPING TOTAL FINANCIAL LITERACY AS A CONSTANT (BENCHMARK GROUP: MALE) 26
TABLE 9: REGRESSION OF RISK AVERSION BETWEEN MEN AND WOMEN INTEGRATING AN INTERACTION VARIABLE (BENCHMARK GROUP: MALE) 27
TABLE 10: TWOWAY GRAPH INCLUDING RISK AVERSION BETWEEN MEN AND WOMEN AT EVERY TOTAL FINANCIAL LITERACY LEVEL 28

1 Introduction

The introductory chapter presents the reader with a background on the topic, by introducing risk perception and the historical context of decision-making. It delves into the current climate of financial literacy among young adults, both in the United States and Sweden. It moves on to a detailed problem analysis with the purpose to interpret the problem within the scope of this thesis. This is done by emphasizing the role of financial literacy in risk aversion between genders. This analytical process leads to this research's purpose and two stated research questions.

1.1 Background

This thesis aims to examine the attitude towards risk among young men and women studying in Sweden. Risk is a part of decision-making and the process of making a decision has throughout history been dominated by mathematical theories, presuming rationality and expected utility maximization from the decision-maker (Edwards, 1954). However, Bernoulli (1954) illustrates how the same situation can be valued differently by people and therefore result in different outcomes. Bernoulli's publications, among others, have influenced studies on different kinds of risk aversions, where the difference in attitude towards risk among genders has been a subject of discussion. Earlier field and laboratory studies have shown lower risk aversion in men compared to women. Although, these studies often fail to control for variables having a potential effect on the results, e.g. knowledge (Eckel & Grossman, 2008).

An essential factor in shaping financial decision-making, particularly for young individuals, is their varying levels of financial literacy. These attributes, skills, and knowledge regarding finance influence their choices regarding financial matters, underscoring the importance of early financial education. Lusardi and Mitchell (2023) illustrate that these decisions have become more complex in recent decades. New and more risky financial instruments and elements such as cryptocurrencies and continuous inflation are arising in the financial market. Lusardi and Mitchell further demonstrate that these factors make financial literacy play an important role in people's ability during economic decision-making. The increasing evolvement of the aforementioned financial instruments creates a macroeconomic problem.

People in general lack financial literacy, which decreases their capability to make good financial decisions (Lusardi & Mitchell, 2023).

In earlier research, Lusardi and Mitchell (2007) found evidence that one-third of young people in the United States with a commerce background appear underinformed or have low financial literacy in economic and financial concepts such as interest rates, inflation, and risk diversification. Lusardi, Mitchell and Curto (2010) discuss how these factors affect the ability to utilize their resources to make financial decisions. In addition, a more recent study in Sweden shows evidence that for individuals between 18-29 years old, financial literacy is remarkably low. The survey includes five questions regarding, inflation, risk diversification, and interest rates, where only 1 out of 5 respondents answered correctly on all five questions. In particular, women performed worse with more incorrect answers compared to men. The study proves that their low financial literacy affects their financial decisions in their everyday lives (Samuelson, Levinsson & Ahlström, 2024). Furthermore, Monika Aggarwal's (2019) research highlights how financial literacy significantly shapes the risk-taking behaviors in young individuals' decision-making processes. The level of literacy impacts the selection of various financial assets and instruments, indicating that a deeper understanding of financial concepts can lead to more risk-taking investment choices. Further research based on a Swedish study finds that women are less active in the stock market and suggests financial literacy could play a part in their participation (Almenberg & Dreber, 2012).

1.2 Problem description and analysis

Risk aversion is a behavioral trait where individuals prefer certain outcomes over uncertain ones, even if the expected values are identical. Even though earlier studies find a significant difference between men and women when it comes to risk aversion, there still exists a debate regarding gender's causal effect on the difference in risk aversion. These findings often face limitations due to inadequate control of influencing variables such as financial literacy.

Furthermore, financial literacy emerges as a critical determinant of financial decision-making among young people. The evolving complexity of the financial landscape underscores the importance of financial education (Lusardi et al, 2010). Earlier research suggests that women's participation in financial fields such as the stock market, is lower than men’s and therefore has an effect on the gap in risk aversion (Almenberg & Dreber, 2012). Since studies

that conclude higher risk aversion for women fail to control for variables such as financial literacy, one can not ignore the potential effect financial literacy might have.

The outcome of controlling financial literacy could impact the gender gap differences in risk aversion and its effect on decision-making. Earlier studies do not consider equal or similar financial literacy when assessing the difference in risk aversion between men and women, which creates a gap in current available research. This thesis therefore intends to update the current empirical work whilst also studying a new and more specific group. The target group in question is concentrated to men and women in the age group of 18-25 who are currently enrolled in university studies in Sweden, which differs from the majority of earlier research that focuses on populations in the United States. Earlier studies in Sweden such as Almenberg and Dreber (2012) have an age group between 18-79 and are also supposed to represent the whole population, different from this study's focus on young adults. Almenberg and Dreber also use data from 2010, which implies the need for data that is more up-to-date.

1.3 Purpose and Research Questions

The purpose of this study is to examine if there exists a difference in risk aversion among young men and women studying a university education in Sweden. The study will also inspect if a potential difference in financial literacy has a causal effect on risk aversion. To achieve the purpose of this research, the following research questions have been formulated:

I. Is there any difference in risk aversion between young male and female students in Sweden?
II. Does financial literacy affect the potential gap between the genders' risk aversion?

2 Theoretical framework

This chapter provides the reader with the necessary theoretical background for the topic of this thesis. Provided are diverse theories regarding risk aversion, prospect theory, ambiguity aversion, and evolutionary theory. These theories have been a foundation for the analysis and discussion of this thesis.

2.1 Risk Aversion

The theory of risk aversion is closely connected to expected utility theory during a decision-making process. Research from John Pratt (1964) and Kenneth Arrow (1965) demonstrate how an individual's inclinations are expected to be represented as expected utility. The mathematician Johan Jensen (1906) proved with Jensen's Inequality that individuals are risk averse if their utility function is concave. This principle has significant implications in practical decision-making, as the framework examines the understanding and predicting of individuals' behavior under risk.

Werner (2008) discuss that when having an individual's expected utility preference as $E[u(\tilde{x})]$ and u from the utility function of Von Neumann-Morgenstern, an individual is assumed to be risk averse if the expected utility preference is equal to or lower than the utility of expected risky wealth, for all risky wealth $\tilde{x}$. This condition serves as a benchmark to examine risk aversion. Supporting the expected utility of how individuals make different choices between uncertain outcomes, the inequality illustrates a notion for a specific risk-averse person that prefers a guaranteed outcome over an uncertain one with equal expected returns. This concept of risk aversion underscores much of economic and financial decision-making analysis throughout modern research and studies.

Werner (2008) also identifies risk compensation as useful to scale risk aversion and therefore being able to compare between individuals. The formula is interpreted as the proportion $\rho(w,\tilde{z})$ of wealth that can be removed from an individual while substituting with $\tilde{z}$ which contains an assumption of zero risk at starting wealth w. If one individual with risk compensation $\rho_1(w,\tilde{z})$ is equal to, or more than another individual with risk compensation $\rho_2(w,\tilde{z})$ then the first individual is perceived as more risk averse.

Closely related to risk compensation is the Arrow-Pratt measure of absolute risk aversion as Werner (2008) further discusses. It is portrayed as the negative second derivative of utility with a certain amount of wealth (quantifies u's level of concavity) divided by the first derivative of the same utility and wealth. In addition to absolute risk aversion, Arrow-Pratt measures relative risk aversion, i.e. risk per unit of dollar of an individual's wealth. Relative risk aversion describes the relationship between how an individual's risk tolerance changes when wealth increases.

2.2 Prospect Theory

Prospect theory was developed by psychologists and behavioral economists Daniel Kahneman and Amos Tversky (1979). Their theory provides a critique of the famous model of expected utility theory as an explanatory representation of decisions under risk. The critique is descended from effects and situations where having to choose between risky options conflicts with utility theory. It particularly conflicts with the utility theory's stance that risk aversion is equal to the concavity of the utility function.

Kahneman and Tversky describe various effects having an impact on individuals ' decision-making. The certainty effect opposes the expected utility theory's approach that utilities should be calculated in the form of probabilities. This effect imposes that individuals tend to overestimate certain outcomes in comparison to uncertain outcomes. This leads to risk-seeking behavior when losses are certain and risk-avert behavior when profits are certain. Another contradiction of the utility theory is the isolation effect whereby options with the same result but dissimilar paths to the result, are treated differently. This effect contributes to inconsistencies in individuals' attitudes toward risk when framed differently.

With these effects, Kahneman and Tversky were able to create the prospect theory where an individual's final value regarding risky choices is based on gains and losses, instead of the finalized capital value. Thereby, decision weight is introduced and used instead of probabilities.

2.3 Ambiguity Aversion (Ellsberg Paradox)

Individuals' financial knowledge can differ considerably and the difference can be a factor influencing people's decision-making between risky prospects. Daniel Ellsberg (1961) developed a concept called ambiguity aversion, explaining that people prefer known risks over unknown risks (ambiguity). Ellsberg illustrates that the concept is closely connected to financial literacy where confidence in understanding financial products and concepts, might influence how people assess risk and make decisions.

Ellsberg's studies also explore decision-making under uncertainty with ambiguity as a focusing factor. This provides a theoretical basis to understand how young men and women with equal levels of financial literacy might make differential financial decisions based on ambiguity tolerance.

2.4 The Evolutionary Theory

The biological difference in decision-making between men and women can be explained based on The Evolutionary Theory. Research from Lee Ellis (2011) proposes that numerous gender differences in cognition and behavior can be explained by the evolutionary theory. Ellis discusses that the male masculine evolution is influenced by androgens (male sex hormones). These androgens decrease the sensitivity to environmental stimuli and force a task-focused distribution of cognitive functions. Ellis (2011) further explains that these hormones contribute to a lower risk aversion and higher risk propensity for males. She demonstrates that this aligns with the fundamental basis of the evolutionary theory of male's preference in taking risks, and the opposite basis for females. The framework of the evolutionary heory together with Ellis' research clarifies the gender difference in cognitive and behavioral patterns through genetic evolution development in males and females (Ellis, 2011).

2.5 Theory Relevance

All these theories together provide a comprehensive understanding of the differing financial behaviors and risk aversion between men and women. Each theory contributes through different perspectives. Expected utility theory highlights rational decision-making under uncertain outcomes, prospect theory illuminates decision-making biases and deviations from

rationality, Ambiguity Aversion focuses on the impact of updated informational risks, and evolutionary theory explains the biological determinants of risk preferences between men and women. Together these frameworks illustrate a holistic view of how financial literacy affects risk prosperity/behavior under differences in demographic and gender prerequisites.

3 Literature Review

This section equips the reader with substantial literature before delving into the research of this thesis. The five articles presented below are more up-to-date compared to the theoretical framework and provide this thesis with an even higher quality. The articles are then supposed to be used as comparison tools for the results of this thesis.

Marja-Liisa Halko together with Markku Kaustia and Elias Alanko (2012) demonstrates the relationship between gender and stock holdings in Finland. In their study, the essential factors to explain gender differences are to control financial knowledge and risk aversion. The research examines the effect of men's and women's participation in the stock market. The underlying reason for gender differences is that women's higher risk aversion extends to financial aspects. The chosen study's method involves surveying to examine risk attitudes among 77 students. This method allows for the collection of quantitative data on how students perceive and react to various risks. The study further shows that among individuals experienced in financial risk-taking, gender significantly influences risk attitudes, highlighting the need to explore gender-based differences in financial decision-making.

In another article, Johan Almenberg and Anna Dreber (2012) examine the gender gap in stock market participation and whether financial literacy is a contributing factor to this gap. They further inspect whether financial literacy could clarify parts of the difference in risk aversion among men and women. They do this by analyzing a survey which is conducted by the Swedish Financial Supervisory Authority (Finansinspektionen) which contains 1300 adults aged 18-79 who represent the population of Sweden. They use questions about risk attitudes, basic financial literacy, and simple calculations. The method involves using existing survey data of a random sample to analyze market participation between genders. The study's result suggests that financial literacy plays a role in the difference in stock market participation which, if not controlled for, would give heavier gender effects. However, they could not conclude whether financial literacy could explain the gap in risk aversion between genders.

In a further study, executed by researcher Anna Boschini together with Anna Dreber, Emma von Essen, Astri Muren, and Eva Ranehill (2019) a thorough research is given on the gender differences in risk preferences and competitiveness among a random Swedish population

sample. Analyzing the risk preference across genders results in no significant differences in risk-taking behavior between men and women in the Swedish population, which is in contrast with earlier studies that suggest men are generally more risk-tolerant. Boschini's methodological choice of conducting a phone-based survey to collect different perspectives for research on gender differences, presents potential effects of the study´s structured anonymity and the generalizability of every individual answer. The anonymity factor preserves a more diverse and precise result from each individual. The study further underscores the importance of gender differences in behavior toward risk-taking factors. They include different demographic factors in the study that could impact the gender gap in risk aversion.

Annamaria Lusardi with Olivia S. Mitchell (2023) contributed two decades of research to financial literacy, building on theoretical work from financial knowledge. As a conclusion from several referenced studies, Lusardi and Mitchell bring forth the effects and consequences of financial illiteracy among individuals. Furthermore, Lusardi and Mitchel underscore financial literacy's role in enhancing individuals' economic decisions across all life stages. Their research, grounded in comprehensive surveys, reveals a striking global deficit in basic financial understanding. In comparison, Emma Samuelsson with Henrik Levinsson and Richard Ahlström (2023) conducted a survey aiming to measure young adults' financial literacy, personal financial situation, and self-reported mental health in Sweden. This method enhances survey accuracy by selecting respondents randomly and conducting a pilot survey with test participants to verify quality before deploying the actual survey. Additionally, the survey respondents are anonymous to ensure confidentiality and no further bias. The study reveals a clear deficit in young people’s financial literacy, with women showing lower levels of financial literacy compared to men. Samuelsson et al. further explain that young adults’ lack of financial literacy challenges their everyday financial situation. This should urge interventions within areas such as financial education and more support among young adults to counteract early-life overindebtedness. As the article highlights the link between financial literacy, financial well-being, and mental health, their findings emphasize the importance of improving the overall quality of life for young Swedes.

4 Methodology

The methodology chapter presents the reader with the survey-based method that was used when conducting the research. It describes how the survey was constructed, the selection of respondents and choices made along the way. It also addresses how the thesis treats research ethics and problematizes the method by discussing limitations.

4.1 Method in General

This study is explanatory with a focus on risk tolerance between young men and women in Sweden. The primary method is quantitative in combination with a deductive approach. This means that the study uses earlier research in combination with theory to achieve the optimal result and fulfill the purpose of the research (Jacobsen, 2017).

Data has been collected through a survey distributed to students aged 18-25 in Gothenburg. The survey gathers information on respondents' risk tolerance and demographic details, such as age, gender, and education. These variables will contribute to the purpose by acting as measurements during the analysis of the data collected. The survey will also focus on the respondents' financial literacy to observe if different levels of financial literacy could be a reason for a potential difference in risk aversion among men and women. This is to investigate if similar financial knowledge will minimize a potential difference in risk aversion between genders.

A similar structure to Almenberg and Dreber's (2012) study on stock market participation was chosen. The survey contains three sections, firstly examining people's relation to risk, secondly their ability to perform simple mathematics (basic financial literacy), and lastly their level of knowledge regarding financial concepts (advanced financial literacy).

4.2 Questionnaire Survey

A questionnaire survey has been used to achieve the purpose of the thesis. Roopa and Rani (2012) describe a questionnaire as a record of questions being answered by individuals to collect their viewpoints and is the primary method to gather quantitative data. The method is usually cheap and quick to use, which suits this research since it needs to reach many people

while being on a low budget. The time horizon is also important since this thesis has a strict deadline.

4.2.1 Selection of Respondents

The purpose of the study is to examine risk aversion and financial literacy in young students in Sweden. A Swedish citizen is legally an adult when they turn 18 years old (Migrationsverket, 2023) and the brain has been proven to not be fully developed until 25 years old (Arain et al, 2013). Therefore, in the selection of respondents, the study minimizes the age span to 18-25 years, in order to capture the adolescent years.

Gothenburg has been used as a sample area due to accessibility. Reaching all universities in Sweden would take a huge amount of time, would be costly, and might not even be possible due to inaccessibility. Gothenburg is assessed to be a good representative of the population of Swedish students due to its diversified supply of education. The city is also the second most popular in Sweden in terms of registered students during the spring term of 2023 (Universitetskanslersämbetet, n.d.). The ranking illustrates the popularity of studying in Gothenburg and indicates that people move to study in the city, making it an even more suitable representation of Swedish students.

With the target group set, the study used a simple random sample to select the individualized respondents. This method is the easiest way to collect a sample to generalize it to the population (Patel and Davidson, 2011).

4.2.2 Formulation of Questions

The most common way to structure a survey is to start with neutral questions that provide information regarding background variables (Patel and Davidson, 2011). Therefore, the introduction of the survey (questions 1 to 5) was constructed to become acquainted with the respondent where they were asked about education, gender, age, and their participation in trading with financial securities, as can be seen in appendix 1.2.

The main part of the survey, between introduction and closure, is supposed to include questions regarding the research questions (ibid 77.). We have extracted questions from earlier studies and customized them in order to suit the purpose of this thesis. This part is

divided into three sections throughout the survey. The first section, consisting of questions 6-10 (appendix 1.3) is about the respondents' risk aversion, which allows for assessing each respondent's risk attitude and comparing between men and women. However, question 8 and 9 were removed from the analysis.

Question 6 is used to find the lowest amount the respondent would accept to avoid risk and has been used by Guiso et al. (2013). The respondent will face two alternatives. The first alternative offers 5000 SEK with 50% probability of receiving it while the second alternative offers 500 SEK with 100% probability of receiving it. If the respondent chooses the second alternative, the survey will move on to question 7. However, if the respondent chooses the first alternative, the sum of money in the second alternative will increase with 500 SEK (maximum of 4500 SEK) until the respondent chooses the second alternative. Therefore, we can calculate risk compensation with the formula Werner (2008) describes as the amount an individual is willing to give up to avoid risk. Question 7 is a question also used by Guiso et al. (2013) to analyze relative risk aversion. This type of risk aversion can be assessed since the respondent encounters the same risk-return tradeoff. The answers to these questions will be transformed into a 10-numbered scale, where a high number equals high risk and low-risk aversion.

Question 10, as utilized by Dohmen et al. (2011) acts as a reliable tool to assess risk attitude. The question is not only asking about our specific environment of research, i.e. finance, but risk in general. Dohmen argues that personalized beliefs regarding our topic of experiment can affect the willingness to take risks. Therefore, this question makes the results more trustworthy by holding personalized beliefs constant. A similar question was also used by Almenberg and Dreber (2015) when analyzing risk aversion in the Swedish population.

The second section (appendix 1.4) covers basic financial literacy in the form of calculations. This section includes questions 11-15 and has been formed by analyzing Lusardi's (2012) research on numeracy, financial literacy, and financial decision-making. They are structured so the respondents are exposed to several different situations, including multiplication, division, compounding, and percentage. These questions will be assessed by counting the number of correct answers which then can be compared to different levels of risk aversion.

The third section (appendix 1.5) covers advanced financial literacy, question 16-20. This set of questions examines the respondents' comprehension of financial products and exposes them to a variety of financial concepts. The questions include common abbreviations, assets level of risk, common strategies, and the meaning of financial instruments.

When constructing this survey, one has to first consider how much responsibility to give the respondent in terms of the design and order of the questions, this is called standardization. The questions in this survey adhere to a high level of standardization since all of the questions are the same for all of the respondents. This approach facilitates ease of generalization and comparison. Another important aspect to consider is to what degree the respondents are permitted to interpret the questions based on their individual experiences and attitudes, which is called structuring. This survey is characterized by questions having a high level of structuring given that most questions feature predefined options. Thus, balancing high standardization and structuring becomes crucial for collecting honest answers. By varying the options, the survey can maintain respondent engagement and prevent monotony (Patel and Davidson, 2011).

4.2.3 Test of Survey

To enhance the questionnaire, a pilot survey was constructed. Patel and Davidson (2011) argue that a pilot survey should be done to create the possibility of adjustments to any unclear or wrong statements. This would ensure a high quality of the actual survey results and minimize the risk of misconception by respondents. They also discuss the importance of conducting the test on a representative group. The survey was distributed to a cohort of 15 respondents, all of whom were in the age group of 18-25 and studying in Sweden, although not in Gothenburg. The deliberate exclusion of Gothenburg was to ensure that nobody would participate in both the pilot survey and the real survey, which could produce distorted results. The pilot survey resulted in important feedback leading to adjustments in the formulation of questions, spelling, and clarity.

4.2.4 Data Collection

The survey used a multifaceted approach for data collection in order to optimize the outreach and gather data from the correct target group. Since the survey was internet-based, the most effective way was to send out emails and post on social media. The two digital platforms used were Facebook and LinkedIn. The second method used to collect survey responses was

the survey administrators engaging directly with potential respondents. This allowed for a deeper involvement of the study's target group. The direct engagement was played out on the different faculties at the University of Gothenburg where students were asked to participate. The students who participated were offered candy and all participants had the chance to win prizes by including their email at the end of the survey. The survey was available for one month before closing.

4.2.5 Principles of Research Ethics

When conducting research, there are some guidelines researchers must obey, mainly four requirements. The first is the information requirement. The researchers must inform the respondents about their role in the research. It is also important to let participants know that their partaking is fully voluntary, in all aspects that could affect their willingness to participate (Vetenskapsrådet, 2002). To fulfill this requirement, all posts about the survey as well as the front page of the survey, contained the information that they could choose not to participate and what their role was.

The second principle is the requirement of consent. This principle illustrates that the researchers must collect the consent of the respondents. During a questionnaire survey, one can consider the consent to be collected once the respondents have filled out the survey, as long as the principle of information requirement is satisfied. The third principle is the requirement of confidentiality. Personal details must be stored in a way that no unauthorized people can get hold of them. All data was stored in the survey which required a personal password and could only be reached by the writers of this thesis. The fourth principle is the requirement of utilization. All details about individuals are only allowed to be used for the research in question (ibid). The collected details were downloaded into an excel spreadsheet and imported into STATA. After being used to collect the results and answer the research questions, the details were deleted.

4.3 Criticism of the chosen method

There are weaknesses with the chosen method that one must be aware of. By having an internet-based survey, there is a risk of having poor control over the selection of respondents and making a potential follow-up hard to go through with. Furthermore, the survey might not access the wanted respondents due to the risk of being filled out by someone else (Roopa and

Rani, 2012). The weakness of bad control could also lead to the respondents using tools such as a calculator or the internet. Since the survey tests numeracy and financial literacy, the risk of using external tools could potentially inflate the respondents' scores.

Another notable limitation of the method is the failure to account for the level of income for each respondent. As mentioned, Kahneman and Tversky (1979) illustrate how an individual will base their choices based on gains and losses rather than finalized capital value. This thesis does not take into account this aspect, thus creating the danger of risk aversion being affected when levels of income are not kept constant. However, this study contains students and according to Finnerman and Holmvall (2015), four out of five full-time students receive financial aid and/or loans from CSN. Consequently, it is reasonable to expect that the majority of respondents have a similar level of income. Likewise, the results might have been different if sums of other magnitudes were incorporated into the questions regarding risk aversion. Larger sums of monetary value could affect respondents' decisions. Therefore, an opportunity for improvement would be to include the respondents' levels of income and also expose them to various monetary magnitudes.

5 Data

In this chapter, the reader is provided with a description of how the data was collected and processed. It begins with explaining the cleaning of the data and results from the survey. The results will be presented as statistics representing the respondents' gender, educational background, financial literacy and risk aversion. Thereafter, the reader receives information on how the data was analyzed, along with details about variables, their description and the code used, in the form of a table.

5.1 Cleaning the Data

The data set is processed to be more suitable for this thesis and thus fulfill the purpose. The process included a cleansing of observations that do not satisfy the criteria of the target group. For this study, we only look at respondents studying in Gothenburg, aged between 18-25, and define themselves as a man or a woman. This cleansing reduced the dataset by 75 observations, leaving 304 observations for further analysis, which represents 80.2% of the total observations in the survey. In the cleansing process, questions 8 and 9 in section 1 were excluded and not accounted for in the further analysis due to their multiple-choice nature format, which differs from question 6, 7, and 10 which are text-response questions. This exclusion will give the average of question 6, 7, and 10 a more distinct and more comparable result.

5.2 Survey Results

The survey was answered by 379 respondents but brought down to 304 respondents after cleaning the data. Looking at the gender distribution, figure 1 shows that there were 153 men (50.3%) and 151 women (49.7%).

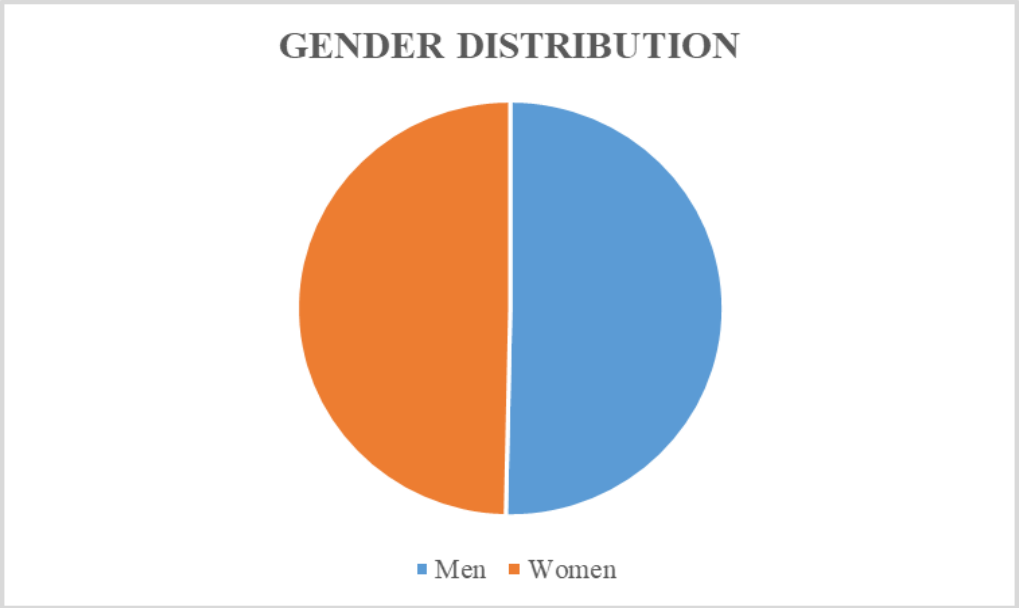


Figure 1: Gender distribution

Figure 2 reveals the educational background, whereas the distribution between educational subjects is heavily weighted toward students in business/economics/finance with 195 responses (58.6%) and the remaining study fields are distributed between 2 to 25 responses (0.8%-8.4%). A middle-level answering rate of health/healthcare/dentist at 20 (6.6%), teachers/pedagogy at 13 (4.3%), social- and behavioral science at 25 (8.2%), law at 15 (4.9%), engineering at 13 (4.3%) and other at 10 (3.3%). Lastly, a low-level frequency for art at 4 (1.3%), Religion/History/Philosophy at 3 (1%), science/mathematics at 2 (0.6%), and language at 4 (1.3%).

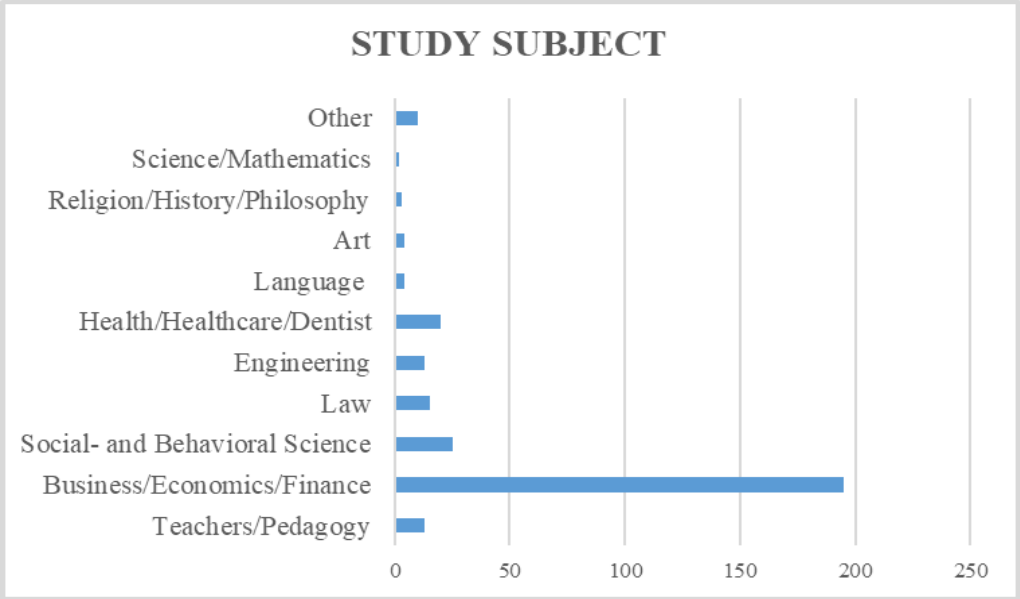


Figure 2: Study subject

Although the distribution of respondents between men and women was equal, it was not the case among the different fields of education. As seen in figure 3, fields such as business/economics/finance, engineering, and mathematics were male-dominated in this survey. In contrast, fields such as health/healthcare/dentist, social- and behavioral science, teaching/pedagogy, and law were dominated by females.

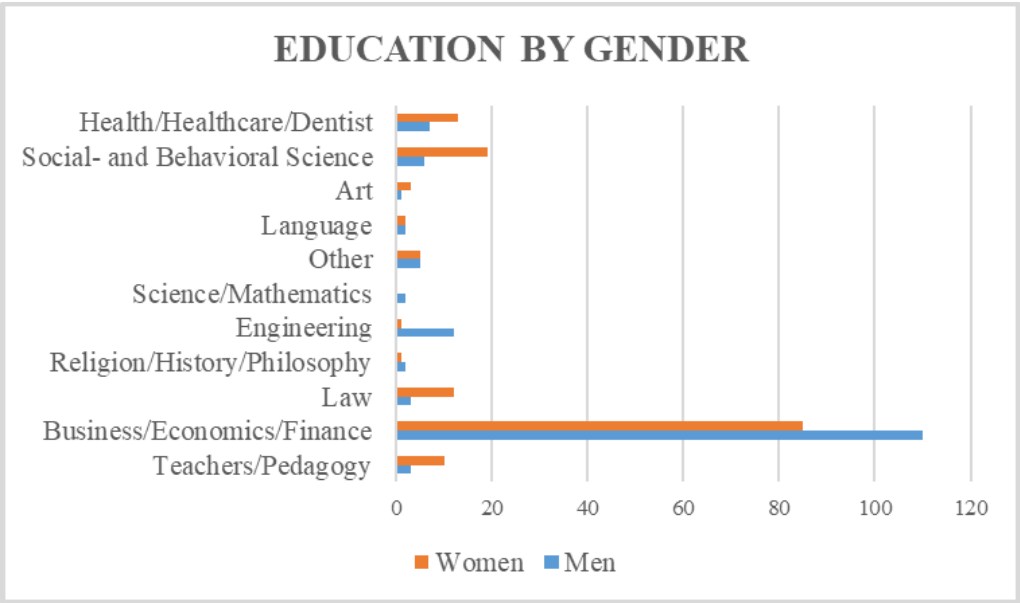


Figure 3: Education by gender

For all respondents, the average financial literacy score in total, including both basic and advanced financial literacy was on average 7.93 on a 10-numbered scale. In total, 49 (16.1%)

of all respondents answered correctly on all 10 questions. Figure 4 illustrates how the distribution of total financial literacy results has a distinct left skewness, containing higher levels of financial literacy. The most frequent score is 9 correct answers out of 10, performed by 95 respondents (31.3%).

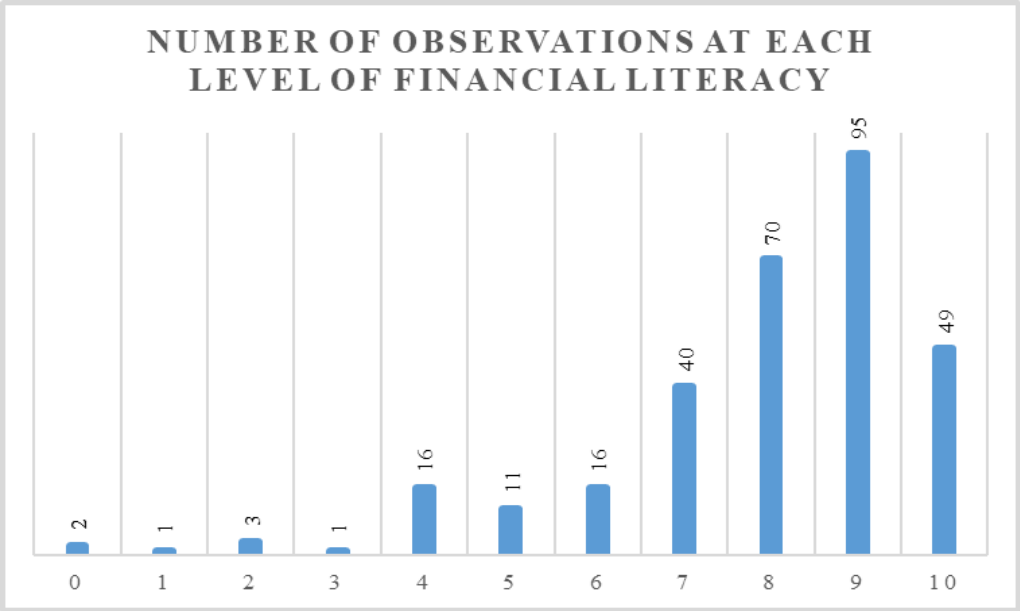


Figure 4: Total financial literacy among all respondents on a 10 numbered scale (Question 11-20)

In figure 5 the risk aversion of all respondents measured throughout questions 16-20 is presented on a 10 numbered scale. The results span between 1 – 8.67 with an average of 4.94.

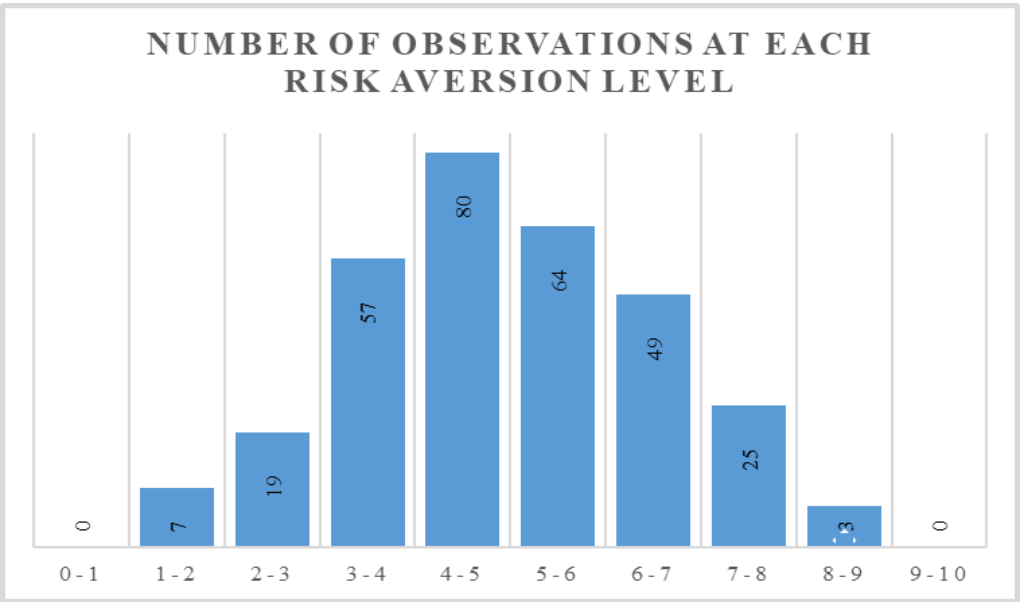


Figure 5: Total risk aversion among all respondents on a 10 numbered scale (Question 6-10)

5.3 Processing and analysis of data

The purpose of this research is to see whether a potential gap in risk aversion between men and women could be explained by the level of financial literacy. Therefore, the study will use a linear regression model to analyze the causality of financial literacy on risk aversion. Ordinary Least Squares was used as an estimate for linear prediction and has also been used by Almenberg and Dreber (2012). The regressions were performed in the statistical software STATA.

To analyze the data most visually and understandably, data conversion through EXCEL was made before inserting the data in STATA. Both to calculate total risk compensation and average results for every respondent's risk aversion, basic financial literacy, and advanced financial literacy. To calculate risk compensation, we use the formula Werner (2008) describes as the amount an individual is willing to give up in order to avoid risk,

$$E[u(w + \tilde{z})] = u(w - \rho(w,\tilde{z}))$$

For this survey, it would be to subtract the respondent's lowest amount from the expected value of taking the risky option. A higher risk compensation will imply higher risk aversion. The formula was used in question 6, where the risk compensation decreases for every extra level of risk the respondent is willing to take. The risk compensation will thereafter be reformulated to a 10-numbered scale to be assessed equally to the other risk aversion questions 7 and 10, where 1 will be high-risk compensation and 10 will be low-risk compensation. For example, choosing the least riskful choice in question 6 is to choose 500 SEK with 100% probability above 5000 SEK with a 50% probability. This gives a risk compensation of 2000 SEK. Converging the result to a 10-numbered scale, 2000 equals the highest level of risk aversion at 10.

In the measurement of question 7, a conversion had to be undertaken, from a 5-scaled respondent ranking to a 10-scaled risk propensity where the lowest risk aversion will equal 10 and the highest risk aversion equals 2.

To present a more distinct risk result for every individual we took the average of every respondent's risk compensation. This was done by summing up the respondent's answers to questions 6, 7, and 10 and divide by three. Questions 8 and 9 were not taken into consideration while analyzing the risk compensation. Primarily, questions 6, 7, and 10 provide a comprehensive view of each respondent's risk aversion, offering a clear overall

picture. In contrast, questions 8 and 9, which are text response questions, differ from the multiple-choice nature of questions 6, 7, and 10, making the last mentioned questions easier to compare due to their structured format. Furthermore, the survey measurement of a 10 scaled risk compensation presents10 as low-risk aversion and 1 as high-risk aversion, which contradicts the original risk aversion degree between 1-10. Thereby, the scale was inverted to demonstrate a representable measurement of risk aversion. The final result includes 1 as low-risk aversion and 10 as high-risk aversion. In addition to risk aversion, the basic financial literacy and advanced financial literacy questions were converted as well. Taking the average of the total result from all 10 questions represents a clear picture of each respondent's total financial literacy level on a 10-numbered scale.

While importing the data from EXCEL to STATA the overall code and definition for all variables can be found in Table 1. To evaluate the difference in risk aversion between men and women, the independent variables of gender and total financial literacy were kept constant while analyzing the dependent variable risk aversion. Additionally, each gender was generated as “female” or “male” to use one of them as a benchmark group, while analyzing their differences in risk aversion. Lastly, to make it possible to analyze the difference between genders’ risk aversion while keeping total financial literacy constant, an interaction term was created between “female” and “TotalFinancialLiteracy”. This enables measuring the differences in how much risk aversion changes on average between women and men as financial literacy increases. This is an important aspect of this thesis since it could illustrate if the relation between risk aversion and financial literacy is not the same for both genders (Ruist, 2021).

Table 1: Variable names, definitions and relevant codes

Variables	**Definition**	**STATA code**
Gender	Social construct defining roles of man and woman.	Gender
Id	Unique identifier for every observation of the survey sample.	Id
Traded Sec Last Y	Definition of Students in Gothenburg that have traded securities within the last year. Answering “Yes” or “No”.	TradedSecLastY
Risk Aversion	Preferences to avoid uncertainty in different outcomes.	RiskAversion

Basic Financial Literacy	Fundamental financial knowledge based on basic mathematical questions such as percentage, division, and compounding.	BasicFinancialKnowledge
Advanced Financial Literacy	Fundamental financial knowledge based on assets risk levels, financial market, and investment decisions.	AdvancedFinancialLiteracy
Total Financial Literacy	Overall knowledge of basic financial literacy and advanced financial literacy.	TotalFinancialLiteracy
Female	Gender identity associated with woman.	female
Male (Benchmark group)	Gender identity associated with man.	male
Interaction Term (Total Financial Literacy*Female)	The combined effect of being female and financial literacy on a certain outcome of risk aversion.	c.TotalFinancialLiteracy#female

5.4 Descriptive Statistics

Table 2 illustrates statistics for men and women combined with 304 observations in total. Financial literacy has an average score of 7.93 out of 10 with 1.87 in standard deviation. The average risk aversion is 4.94 out of 10 with 1.87 in standard deviation.

Table 2: Total descriptive statistics

Total	**Data**
Observations	304
Financial Literacy Mean	7.9276
Financial Literacy Standard Deviation	1.8680
Risk Aversion Mean	4.9375
Risk Aversion Standard Deviation	1.5609

Table 3 shows statistics for men only, containing 153 observations. The men score an average of 8.07. out of 10 in financial literacy with 1.90 in standard deviation. The average risk aversion is slightly less than average at 4.51 out of 10, with 1.49 in standard deviation.

Table 3: Descriptive statistics for men

Men	**Data**
Observations	153
Financial Literacy Mean	8.0654
Financial Literacy Standard Deviation	1.9045
Risk Aversion Mean	4.5098
Risk Aversion Standard Deviation	1.4907

Table 4 presents statistics for women only, containing 151 observations. The women score an average of 7.79 out of 10 in financial literacy with a 1.83 standard deviation. Their risk aversion is in contrast to the men, higher than average with 5.37 out of 10, with 1.51 in standard deviation. These findings suggest that on average, men outperform women by 0.28 points in financial literacy. In addition, women are 0.86 points more risk averse than men on average.

Table 4: Descriptive statistics for women

Women	**Data**
Observations	151
Financial Literacy Mean	7.7881
Financial Literacy Standard Deviation	1.8280
Risk Aversion Mean	5.3708
Risk Aversion Standard Deviation	1.5146

6 Empirical results

This section presents the reader with the results of the study, extracted from STATA. It first demonstrates a t-test for an overview of the difference in risk aversion between men and women. Secondly, the reader is presented with a regression analysis, holding total financial literacy constant. Lastly, a nuanced regression was created by generating an interaction term to compare risk aversion on different total financial literacy levels. The statistics are also thoroughly described for the reader to comprehend the results.

6.1 Regression results

Before analyzing the different levels of total financial literacy, a t-test was conducted. The selection of the t-test for assessing the differences in risk aversion between men and women is grounded in the test's ability to compare the means of two independent genders. As a result, one can conclude if there is a statistically significant difference between them (Ruist, 2021).

In table 5, the t-test is a two-sample test with equal variances, indicating that the data does not show significant variance inequality between groups, allowing for a more straightforward comparison. With 151 observations for women and 153 observations for men, the test has the power to detect a significant difference if one exists. The means of the two groups, 5.370861 for women and 4.509804 for men suggest a divergence in risk aversion levels. The negative value of the mean difference (-0.861057) suggests that men have a lower mean risk aversion score compared to women. This is supported by a highly significant t-statistic (4.5588) and a p-value close to 0 for the two-tailed test. Thus, the probability of observing such a difference, or more extreme, by random chance is virtually zero if there were no difference between the groups' risk aversions. The confidence interval for the difference does not contain zero, further supporting the conclusion that there is a statistically significant difference between the groups. The hypothesis test results (Ha: diff < 0, diff != 0, diff > 0) with their corresponding p-values reinforce the conclusion that the observed difference is unlikely to be due to random variation alone, and there is a statistically significant difference in risk aversion between men and women as defined in this study.

Table 5: T-test of men's and women's risk aversion

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf.	interval]
1	151	5.370861	.1232597	1.514641	5.127311	5.614411
2	153	4.509804	.1205193	1.490741	4.271695	4.747913
Combined	304	4.9375	.0895253	1.560927	4.76133	5.11367
diff		.861057	.1723706		.5218575	1.200256

diff = mean(1) - mean(2) t = 4.9954
H0: diff = 0 Degrees of freedom = 302

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 1.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 0.0000

Table 6, presents β_0, the risk aversion for women when total financial literacy is constant at 0 as 6.6989. β_1 illustrates a change in risk aversion by -0.1705 while increasing total financial literacy by one unit, suggesting a negative relationship. Additionally, both β_0 and β_1 are significant under 5% p-value and the regressions R-squared performance have an explanation power at 4.23%.

Table 6: Regression of risk aversion for women keeping total financial literacy as a constant

Source	SS	df	MS	Number of obs	=	151
				F(1, 149)	=	6.59
Model	14.573284	1	14.573284	Prob > F	=	0.0112
Residual	329.547393	149	2.21172747	R-squared	=	0.0423
				Adj R-squared	=	0.0359
Total	344.120677	150	2.29413785	Root MSE	=	1.4872

RiskAversion	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
TotalFinancialLiteracy	-.170516	.0664282	-2.57	0.011	-.3017789	-.0392531
_cons	6.698853	.5313153	12.61	0.000	5.648967	7.748739

Table 7, presents β_0, the risk aversion for men when total financial literacy is constant at 0 as 4.9160. The coefficient is also significant with a p-value of 0. Furthermore, β_1 illustrates a change in risk aversion by -0.0504 while increasing total financial literacy by one unit, also suggesting a negative relationship. However, β_1 is not significant under 5% p-value. Additionally, the regressions R-squared performance has an explanation power at 0.41%.

Table 7: Regression of risk aversion for men keeping total financial literacy as a constant

Source	SS	df	MS	Number of obs	=	153
				F(1, 151)	=	0.63
Model	1.39817524	1	1.39817524	Prob > F	=	0.4295
Residual	336.392674	151	2.22776606	R-squared	=	0.0041
				Adj R-squared	=	-0.0025
Total	337.79085	152	2.22230822	Root MSE	=	1.4926

RiskAversion	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
TotalFinancialLiteracy	-.050358	.0635657	-0.79	0.429	-.175951	.0752349
_cons	4.915959	.5266889	9.33	0.000	3.875328	5.956591

In table 8, β_0 is 5.377441, showing men's risk aversion while Financial Literacy is held constant. Moreover, β_1 is -0.1076 implying an inverse relationship between total financial literacy and risk aversion. Therefore, keeping other variables constant, an increase in Financial Literacy by one unit decreases the risk aversion by -0.1076 units. Thereafter, β_2 is 0.8312 which indicates that women's risk aversion is 0.8312 higher than men's when financial literacy does not change. All coefficients, β_0, β_2, and β_3 are statistically significant due to no p-value being at a higher level than 0.020. The R-squared for this regression indicates that 9.28% (9.28) of the variation in risk aversion is explained by total financial literacy and female indicators. A relatively low R-squared, suggests that the model does not explain much of the variability in risk aversion.

Table 8: Regression of risk aversion between men and women keeping total financial literacy as a constant (Benchmark group: male)

Source	SS	df	MS	Number of obs	=	304
				F(2, 301)	=	15.40
Model	68.5262754	2	34.2631377	Prob > F	=	0.0000
Residual	669.730669	301	2.22501883	R-squared	=	0.0928
				Adj R-squared	=	0.0868
Total	738.256944	303	2.43649157	Root MSE	=	1.4916

RiskAversion	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
TotalFinancialLiteracy	-.1075758	.0459772	-2.34	0.020	-.1980532	-.0170983
female	.8312284	.1715819	4.84	0.000	.4935764	1.16888
_cons	5.377441	.3899384	13.79	0.000	4.610091	6.144792

From the regression output in table 9, β_0 is 4.915959, which represents the level of men's risk aversion when Financial Literacy and other variables are held constant at 0. This intercept is

statistically significant since its p-value of 0. β_1 is -0.0504 implying an inverse relationship between men's total financial literacy and risk aversion. Therefore, keeping other variables constant, an increase in Financial Literacy by one unit decreases the risk aversion by 0.0504 units. However, the coefficient is not statistically significant at the 5% level with a p-value of 0.428. Comparatively, β2 is 1.7829, illustrating that there is a difference in men's and women's risk aversion when financial literacy is 0. Therefore women's level of risk aversion when financial literacy and other variables are held constant at 0 is 6.6989, The coefficient is statistically significant at the 5% level with a p-value of 0.018.

β3 results in -0.120158, and illustrates the difference in how much the risk aversion changes between men and women while total financial literacy is increasing. The interaction term suggests that financial literacy has a different effect for men and women, regarding their risk aversion. However, this effect is not statistically significant with a p-value of 0.192. Moreover, the regressions R-square is 0.0988, indicating that 9.88% of risk aversion variation is explained by the variables, which are total financial literacy, the female indicator, and their interaction term.

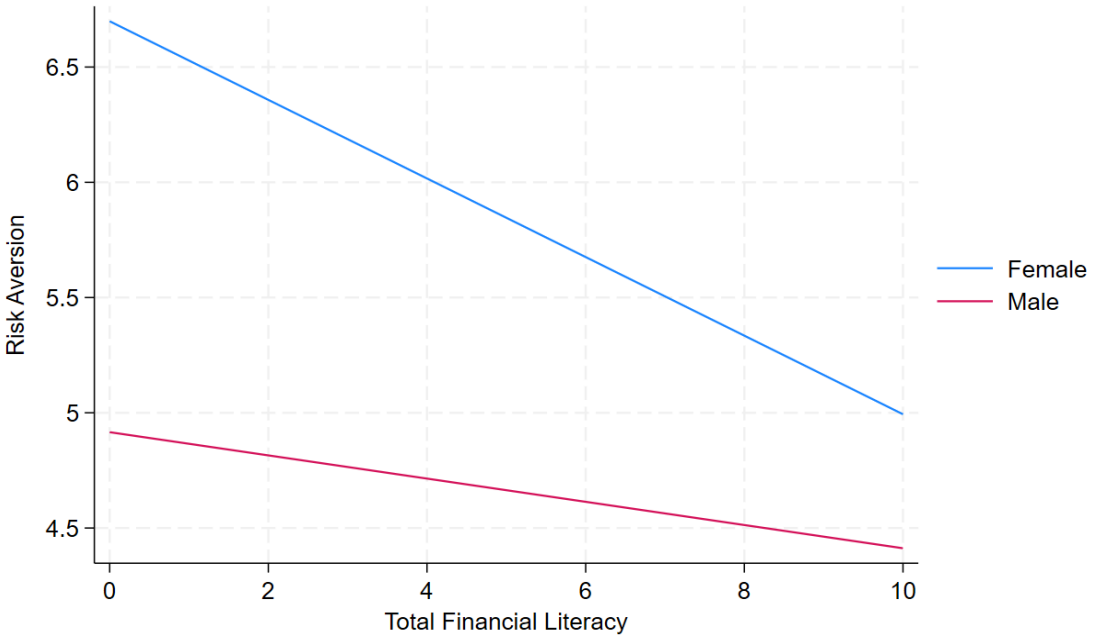
Table 9: Regression of risk aversion between men and women integrating an interaction variable (Benchmark group: Male)

Source	SS	df	MS	Number of obs	=	304
				F(3, 300)	=	10.86
Model	72.3168771	3	24.1056257	Prob > F	=	0.0000
Residual	665.940067	300	2.21980022	R-squared	=	0.0980
				Adj R-squared	=	0.0889
Total	738.256944	303	2.43649157	Root MSE	=	1.4899

RiskAversion	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
TotalFinancialLiteracy	-.050358	.0634519	-0.79	0.428	-.1752252	.0745092
female	1.782894	.7481548	2.38	0.018	.3105977	3.25519
female_x_finlit	-.120158	.0919508	-1.31	0.192	-.3011083	.0607923
_cons	4.915959	.5257464	9.35	0.000	3.881341	5.950577

Table 10 is a graphical illustration of the regression in table 9. It shows the intercept for both men and women when financial literacy is 0, indicating higher risk aversion for women with a gap as big as 1.7829. Although as financial literacy increases both genders' risk aversion decreases. However, the slope for women is steeper than for men, resulting in a smaller difference in risk aversion between the genders, which the interaction term further elaborated.

Table 10: Twoway graph including risk aversion between men and women at every total financial literacy level



7 Discussion

A majority of earlier studies, both historical and recent, conclude that women are more risk-averse than men. Halko et al (2012) argue that women's preferences for lower risk affect their financial aspects. Almenberg and Dreber (2012) use the gap in risk aversion as a foundation for analyzing stock market participation. Furthermore, Eckel and Grossman (2008) evaluate earlier field and laboratory studies with the conclusion that there exists a significant difference in risk aversion between the genders where women are more risk averse. Likewise, the t-test in this investigation generates a higher risk aversion for women compared to men, suggesting the same conclusion as the aforementioned studies. Thereby on a 10-numbered scale, women on average have a risk aversion of 5.3709 while men have 4.5098, a difference of 0.861057. This is supported by a t-test equal to 4.9954 and p-values of 0, making it significant. The result also supports the expected result of the study which originated from previous research. Moreover, this difference in risk preferences between the genders is strengthened by the evolutionary theory. Ellis (2011) discusses how the male sex hormone affects men's behavior in acting more risky, thus, arguing for biological differences as the main reason for a gap in risk aversion.

However, Boschini et al (2019) use a survey to evaluate differences in risk and competitiveness between men and women in Sweden and do not find any significant differences, contradicting previous research as well as this thesis' statistical t-test. The major difference between this thesis and Boschini's research is the target group. Their sample was supposed to cover the Swedish population while this thesis aims to only cover young students in Sweden. This difference suggests that age could be a factor that affects risk aversion between men and women differently. Another perspective on the differences is presented by Eckel and Grossman (2008) who find that studies suggesting a difference in risk aversion among men and women, also dissatisfy the controlling of important variables which could lead to omitted variables bias. If a bias exists, the gap might not be as the t-test or earlier studies suggest. Where variables such as financial literacy could be a vital explanation factor for men's and women's risk aversion. Recent research illustrates the lack of financial literacy for adolescents in Sweden, especially among women (Samuelsson et al, 2024). In addition, ambiguity aversion suggests that financial literacy may perhaps be a vital variable in risk aversion when there is a lack of it among the population. Individuals prefer the known risks

over the unknown which may lead to high risk aversion when dealing with financial concepts (Ellsberg, 1961).

When holding the financial literacy constant in the regression analysis, the difference in risk aversion is slightly lower than without, 0.8312 compared to 0.8610. The regression also presents an inverse relationship between financial literacy and risk aversion, meaning that people with more financial literacy have a lower risk aversion, which supports Ellsberg's (1961) ambiguity aversion. These findings are statistically significant with p-values close to 0. However, to fully fulfill the purpose of this thesis, there must be further evaluations of whether the relation between risk aversion and financial literacy is the same for both genders. Figure 11 illustrates the regression of risk aversion between men and women while integrating an interaction variable. The gap in risk aversion between men and women is bigger when financial literacy is 0 with a difference of 1.7829, which is graphically illustrated in figure 12. Total financial literacy and risk aversion still have an inverse relationship, although this regression allows us to see the difference between men and women. The interaction term is -0.1202 and is the difference in the degree of how risk aversion changes between the genders. Thus, the interaction term would suggest that financial literacy affects risk aversion differently for men and women. Likewise, the graph in figure 12 illustrates this relationship in terms of a steeper regression line for women. Therefore it would mean, that as financial literacy increases, the gap between men's and women's financial literacy decreases. However, while the gap decreases, it still exists.

Having said that, financial literacy's different effect on men's and women's risk aversion is not statistically significant due to its p-value of 0.192 and we can therefore not conclude anything. There is also no possible way to conclude with certainty why the coefficient is insignificant but there are some hypothetical scenarios. The distribution of gender across different faculties was not equal. The faculty for business, economics, and finance was dominated by men. The same goes for engineering, science, and mathematics. Conversely, women dominated faculties such as pedagogy, healthcare, art, sociology, and law. This disparity might lead to skewed results since the male-dominated faculties focus more on numeracy and financial concepts in their educational plan, making the choice of education a possible reason for different results in financial literacy. The interaction term in the regression analysis aims to analyze if the relation between risk aversion and financial literacy contradicts between the genders. Although, if education has played a large role in

determining their financial literacy it might have affected the interaction terms capabilities to detect significant differences.

Almenberg and Dreber (2012) conducted similar research with a survey built on the same structure as this thesis. They examine financial literacy and its relation to stock market participation and risk aversion. They found a statistically significant relation for the gap in risk aversion to remain even after controlling for financial literacy, which further supports our interaction terms insignificance.

8 Conclusion

This thesis examines whether there is any difference in risk aversion between young male and female students in Sweden. The survey and the t-test help us to conclude that there is a significant difference in risk aversion between the genders. Furthermore, the thesis aims to analyze the impact of financial literacy. The multivariate regression analysis illustrates a small reduction in the gap of risk aversion between men and women when financial literacy is held constant. When including an interaction term to analyze if financial literacy affects the genders' risk aversion differently, there were signs of reduced risk aversion with increasing financial literacy. However the coefficients were statistically insignificant.

Our findings offer insights into financial decision-making. However, the regression results are insignificant and the focus on Swedish university students may not be a representative sample for other populations. Further research should investigate whether there exists similar patterns of the relationship between financial literacy and risk aversion in other demographic groups.

8.1 Proposal to further research

This thesis examines a comprehensive exploration of the impacts of financial literacy on risk aversion across genders. To further investigate this relation, more complex factors could be beneficial. Variables such as norms or different income levels, could be held constant to analyze their effect on financial literacy and risk aversion between men and women. The regression results from this study only explain about 10% of the variance in risk aversion, as indicated by the relatively low R-square value. The inclusion of additional factors such as norms and income levels could potentially enhance the model's explanatory power. Exploring whether these additional variables increase the R-square could provide deeper insights into the relationship of risk aversion and financial literacy between men and women as well as improve the robustness of the analysis.

In general, norms have a central role in shaping risk aversion behavior between men and women, such as social and cultural norms, dictating acceptable behavior and attitudes toward risk. Societal expectations might encourage men to take more risks and thereby be portrayed as more masculine and desirable. On the other side, women face other social pressures that could promote caution and reinforce higher risk-avert decisions. These normative factors

have a broader impact on financial aspects such as investment strategies and financial decision-making.

Furthermore, including each individual's (respondents) income level could affect their risk-taking approach. An individual with a higher level of income would most probably value a lower amount of money at stake differently than an individual with a lower level of income. Including this approach would give a more precise picture of each individual's prerequisites which could have explained the power of genders' behavior between uncertain choices.

Moreover, to combat the statistical insignificance that this thesis' results have produced, future research should focus on improving the data collection. To begin with, education should be used as a controlling variable so that it does not act as a confounding variable. This would help to distinguish the desired effects. However, for this to be possible there must be a more equal representation of genders for each field of education and also more respondents for each field of education. Therefore this thesis proposes that further research uses stratified sampling to obtain a more balanced representation.

References

Aggarwal, M. (2019). Financial literacy and investment decisions. Indian Institute of Finance, 33(4), 981-1000. https://financeindia.org/data/2019/FI334/FI-334-Art05.pdf

Almenberg, J., & Dreber, A. (2012). Gender, stock market participation and financial literacy. Economics Letters, 137, 140-142. https://doi.org/10.1016/j.econlet.2015.10.009

Antal registrerade studenter VT2023. (n.d). Universitetskanslersämbetet. Available at: https://www.uka.se/integrationer/hogskolan-i-siffror/statistik?statq=https://statistik-api.uka.se/api/totals/1 (Accessed: 18 April 2024).

Arain, M., Haque, M., Johal, L., Mathur, P., Nel, W., Rais, A., Sandhu, R., & Sharma, S. (2013). Maturation of the adolescent brain. Neuropsychiatric Disease and Treatment, 9, 449-461. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3621648/

Bernoulli, D. (1954). Exposition of a new theory on the measurement of risk. Econometrica, 22(1), 23-36. https://doi.org/10.2307/1909829

Boschini, A., Dreber, A., von Essen, E., Muren, A., & Raneholl, E. (2019). Gender, risk preferences and willingness to compete in a random sample of the Swedish population. Journal of Behavioral and Experimental Economics, 83, 101467. https://doi.org/10.1016/j.socec.2019.101467

Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., & Wagner, G. (2011). Individual risk attitudes: Measurement, determinants, and behavioral consequences. Journal of the European Economic Association, 9(3), 522-550. https://academic.oup.com/jeea/article/9/3/522/2298422

Eckel, C., & Grossman, P. (2008). Men, women, and risk aversion: Experimental evidence. In C. R. Plott & V. L. Smith (Eds.), Handbook of Experimental Economics Results (Vol. 1, pp. 1061-1073). Elsevier. https://www.sciencedirect.com/science/article/abs/pii/S1574072207001138

Ellis, L. (2011). Evolutionary neuroandrogenic theory and universal gender differences in cognition and behavior. Sex Roles, 64, 707-722. https://doi.org/10.1007/s11199-010-9927-7

Ellsberg, D. (1961). Risk, ambiguity, and the savage axioms. The Quarterly Journal of Economics, 75(4), 643-669. https://doi.org/10.2307/1884324

Finnerman, E., & Holmvall, K. (2015). En kort inblick i studenternas ekonomi. Universitets och högskolerådet. https://www.uhr.se/globalassets/_uhr.se/lika-mojligheter/eurostudent/eurostudentv_studentekonomi.pdf

Forskningsetiska principer inom humanistisk-samhällsvetenskaplig forskning. (2002). Stockholm: Vetenskapsrådet. https://lincs.gu.se/digitalAssets/1268/1268494_forskningsetiska_principer_2002.pdf

Guiso, L., Sapienza, P., & Zingales, L. (2013). Time varying risk aversion. https://www.nber.org/system/files/working_papers/w19284/w19284.pdf

Halko, M., Kaustia, M., & Alanko, E. (2012). The gender effect in risky asset holdings. Journal of Economic Behavior & Organization, 83(1), 66-81. https://www.sciencedirect.com/science/article/pii/S0167268111001569

Jacobsen, D. I., Andersson, S., & Holmberg, J. (2017). Hur genomför man undersökningar?: Introduktion till samhällsvetenskapliga metoder. Lund: Studentlitteratur.

Jensen, J. L. W. V. (1906). Sur les fonctions convexes et les inégalités entre les valeurs moyennes. Acta Mathematica, 30, 175-193. https://link.springer.com/article/10.1007/BF02418571

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. Econometrica, 47(2), 263-291. https://www.jstor.org/stable/1914185

Lusardi, A., & Mitchell, O. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education. Business Economics, 42, 35-44. https://doi.org/10.2145/20070104

Lusardi, A., & Mitchell, O. (2023). The importance of financial literacy: Opening a new field. Journal of Economic Perspectives, 37(4), 137-154. https://www.aeaweb.org/articles?id=10.1257/jep.37.4.137

Lusardi, A., Mitchell, O., & Curto, V. (2010). Financial literacy among the young. Journal of Consumer Affairs, 44(2), 358-380. https://doi.org/10.1111/j.1745-6606.2010.01173.x

Lusardi, A. (2012). Numeracy, financial literacy, and financial decision-making. Numeracy, 5(1). https://www.researchgate.net/publication/228319322_Numeracy_Financial_Literacy_and_Financial_Decision-Making

Migrationsverket. (2023). When you turn 18 years. Available at: https://www.migrationsverket.se/English/Private-individuals/Protection-and-asylum-in-Sweden/Children-seeking-asylum/Without-parents/When-you-turn-18-years.html (Accessed: 18 April 2024).

Patel, R., & Davidson, B. (2011). Forskningsmetodikens grunder: Att planera, genomföra och rapportera en undersökning. Lund: Studentlitteratur.

Pratt, J. W. (1964). Risk aversion in the small and in the large. Econometrica, 32(1/2), 122-136. https://doi.org/10.2307/1913738

Roopa, S., & Rani, M. S. (2012). Questionnaire designing for a survey. Journal of the Indian Orthodontic Society, 46(4), 273-277. https://journals.sagepub.com/doi/pdf/10.5005/jp-journals-10021-1104

Ruist, J. (2021). Statistik och regression i praktiken. Lund: Studentlitteraur AB

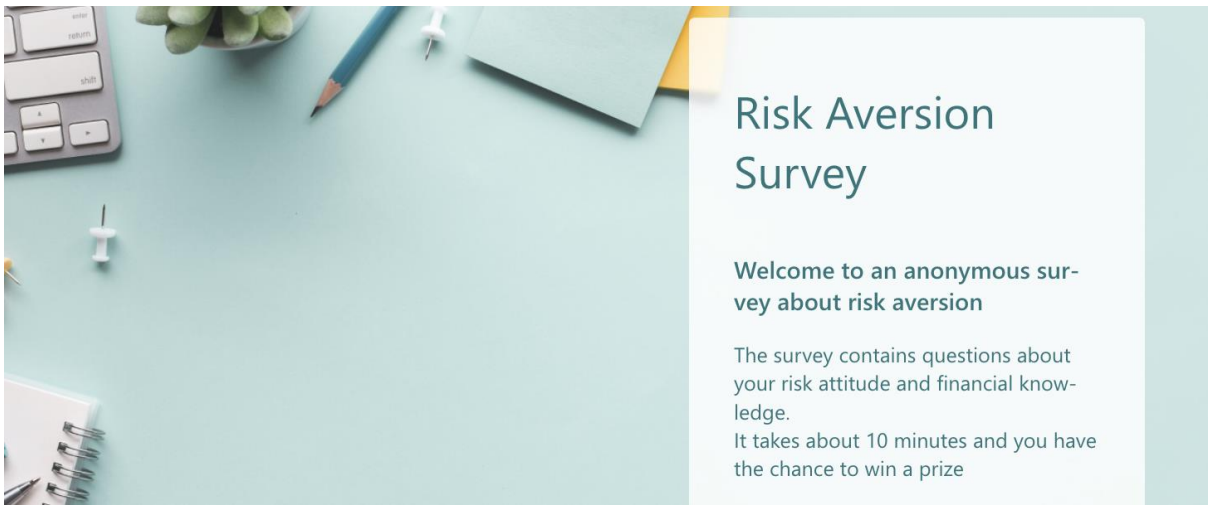
Samuelsson, E., Levinsson, H., & Ahlström, R. (2023). Financial literacy, personal financial situation, and mental health among young adults in Sweden. Journal of Financial Literacy and Wellbeing, 1(3), 541–564. https://doi.org/10.1017/flw.2024.3

Werner, J. (2008). Risk aversion. In S. N. Durlauf & L. E. Blume (Eds.), The New Palgrave Dictionary of Economics (pp. 197-198). https://doi.org/10.1007/978-1-349-58802-2_1440

9 Appendix

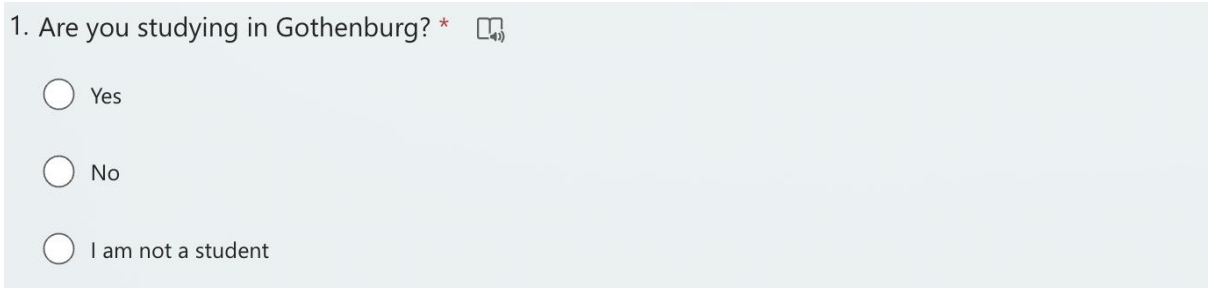
Appendix 1. Construction of Survey

Appendix 1.1

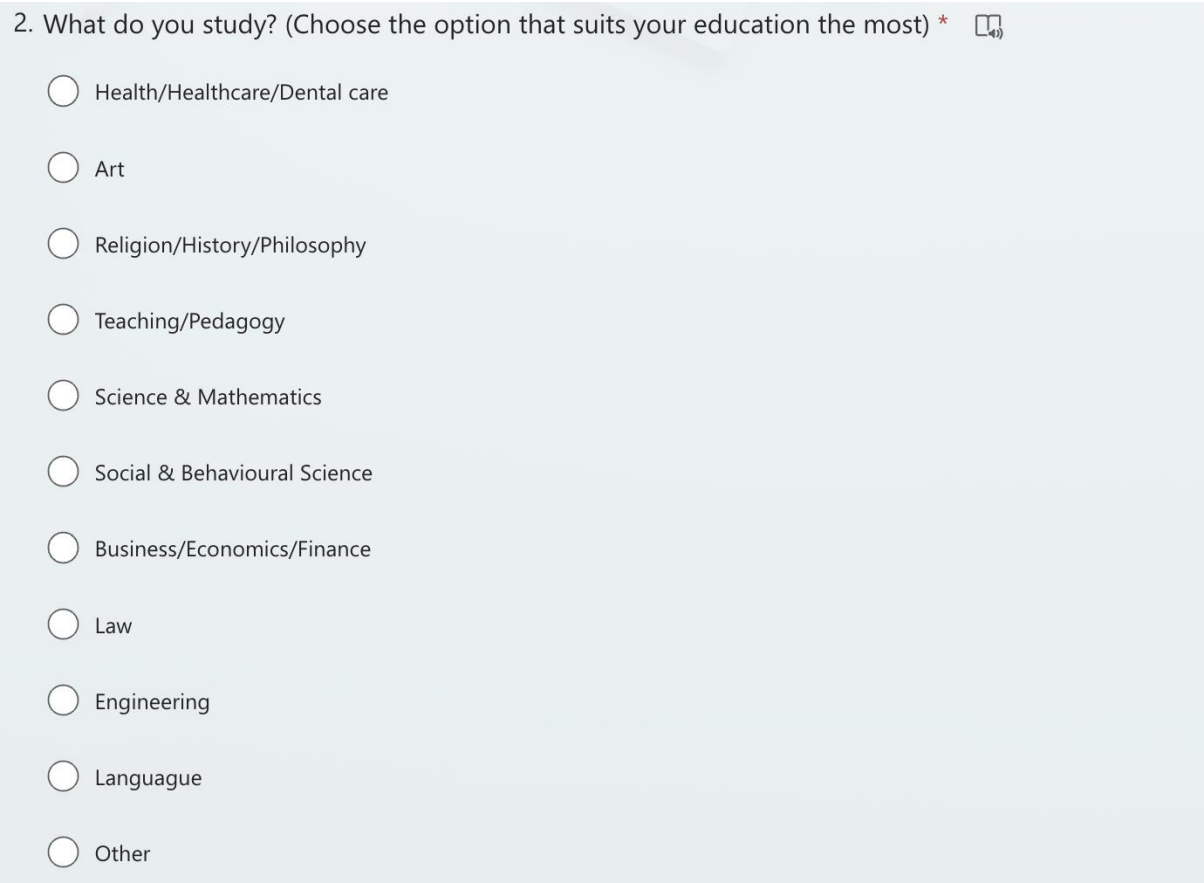


Appendix 1.2

This part contains questions regarding personal information about the respondent
Question 1. "Are you studying in Gothenburg?"



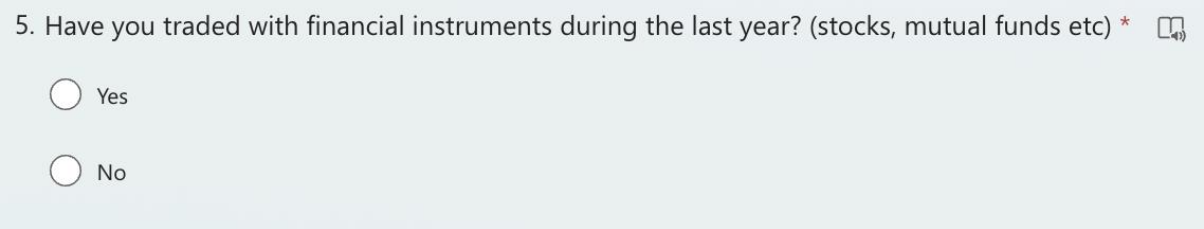
Question 2. “What are you studying? (choose the option that suits your education the best)”



Question 3. “What do you define as?”

Question 4. “How old are you?”

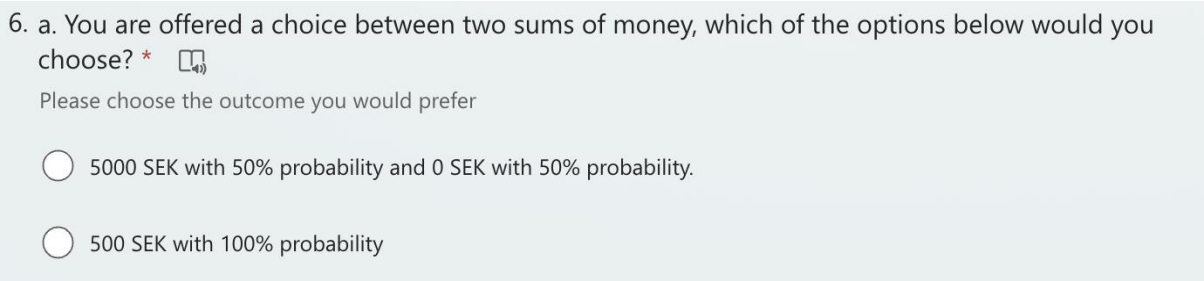
Question 5. “Have you traded with financial instruments during the last year? (stocks, funds etc)”



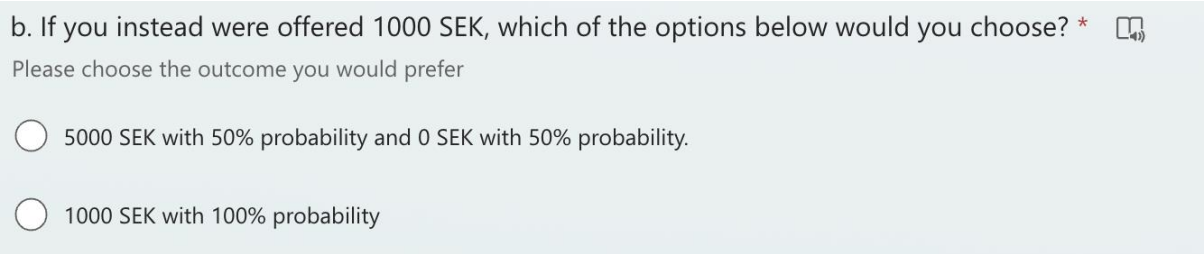
Appendix 1.3

This part is about risk aversion

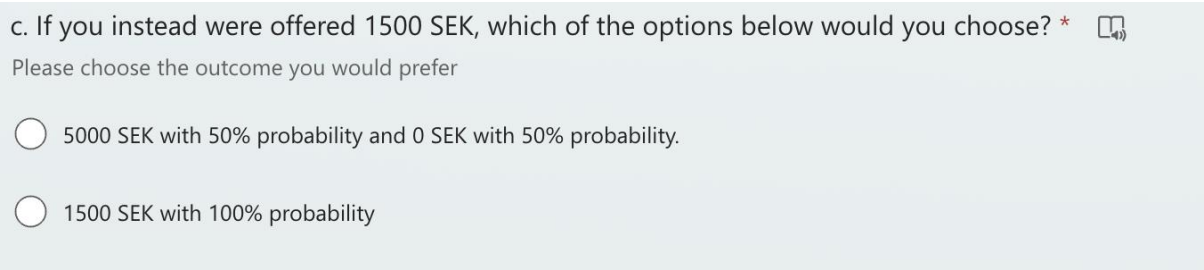
Question 6a. “You are offered to choose between two sums of money, which of the following alternatives would you choose?”



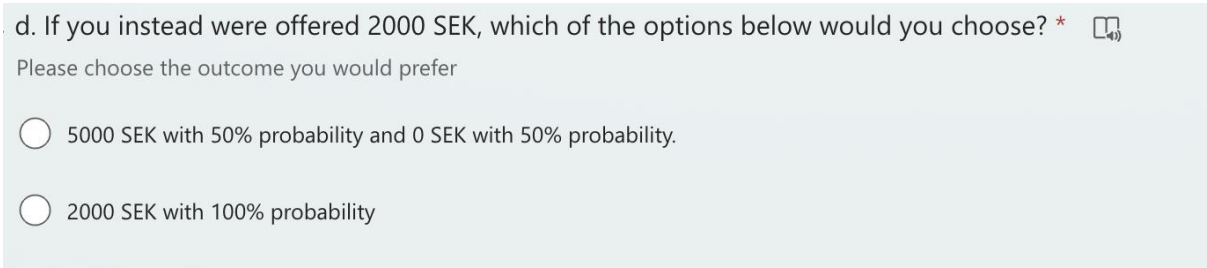
Question 6b. "If you instead were offered 1000 SEK, which of the options below would you choose?"



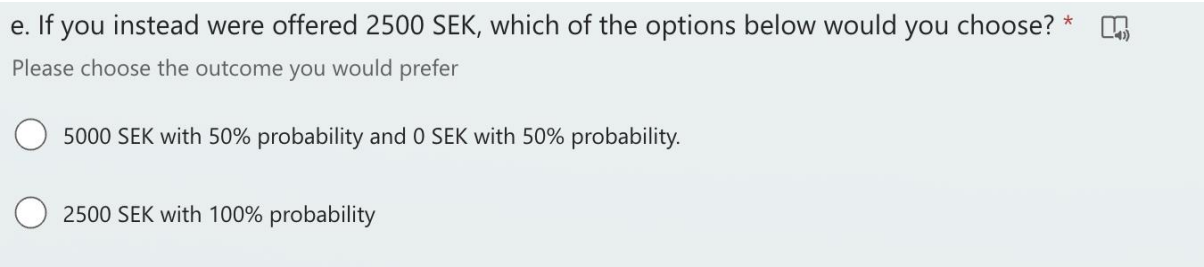
Question 6c. "If you instead were offered 1500 SEK, which of the options below would you choose?"



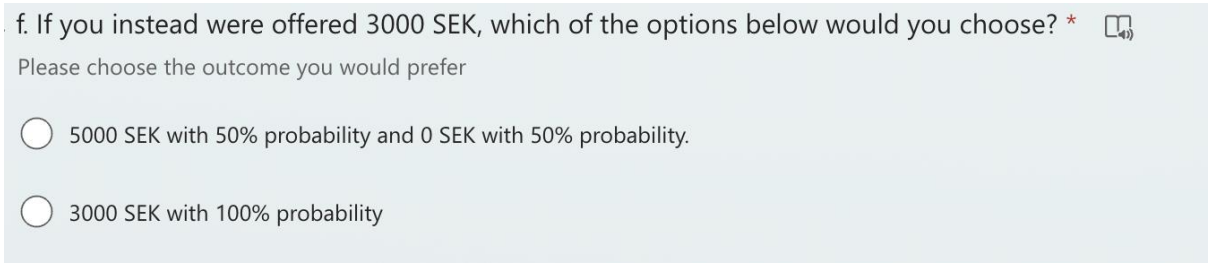
Question 6d. "If you instead were offered 2000 SEK, which of the options below would you choose?"



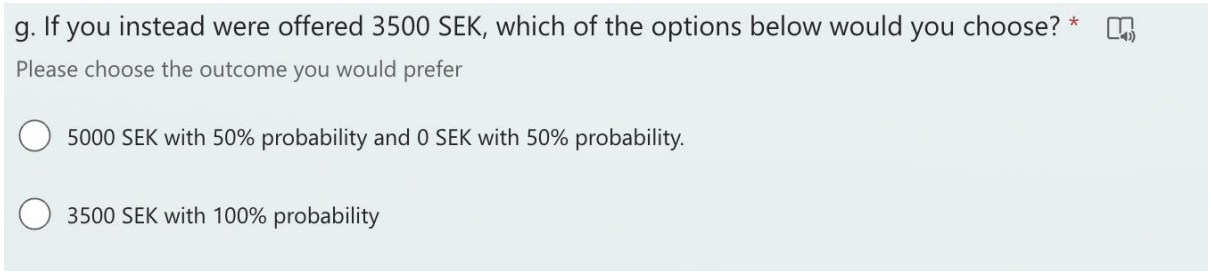
Question 6e. "If you instead were offered 2500 SEK, which of the options below would you choose?"



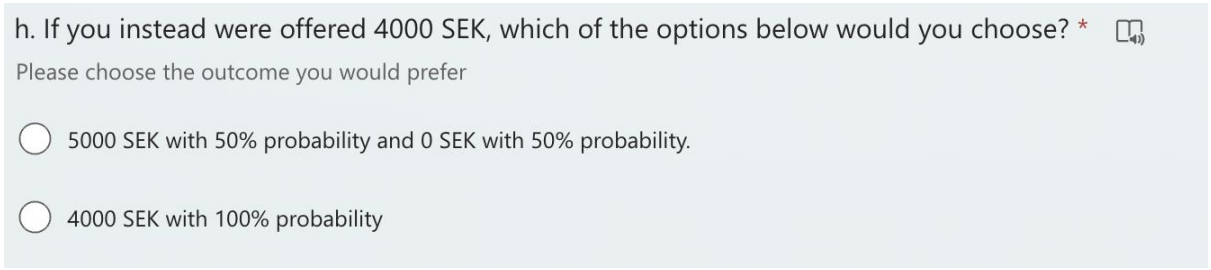
Question 6f. "If you instead were offered 3000 SEK, which of the options below would you choose?"



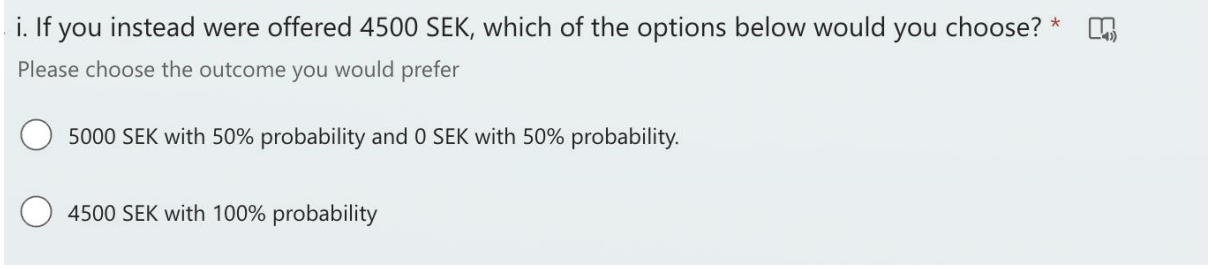
Question 6g. "If you instead were offered 3500 SEK, which of the options below would you choose?"



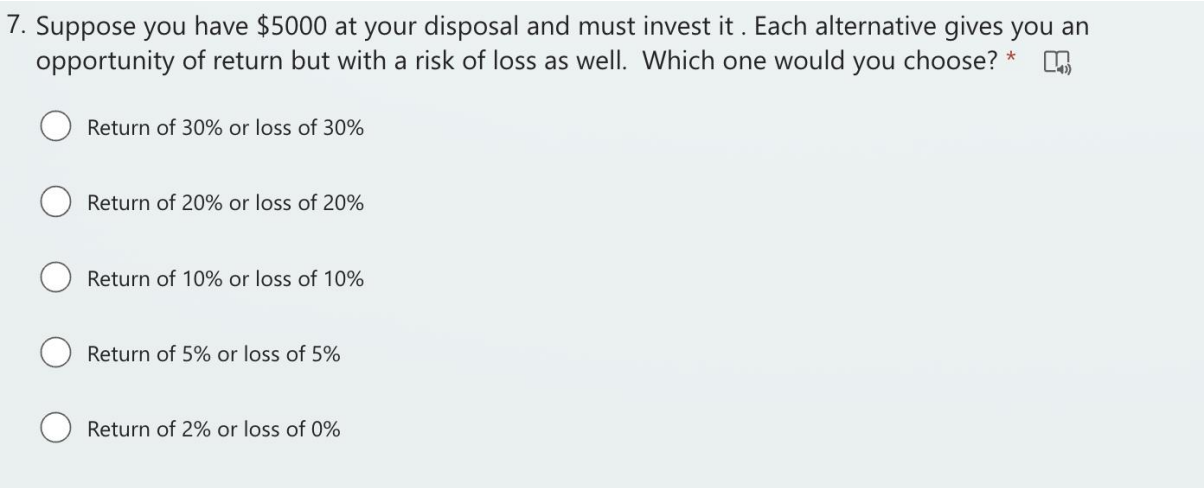
Question 6h. "If you instead were offered 4000 SEK, which of the options below would you choose?"



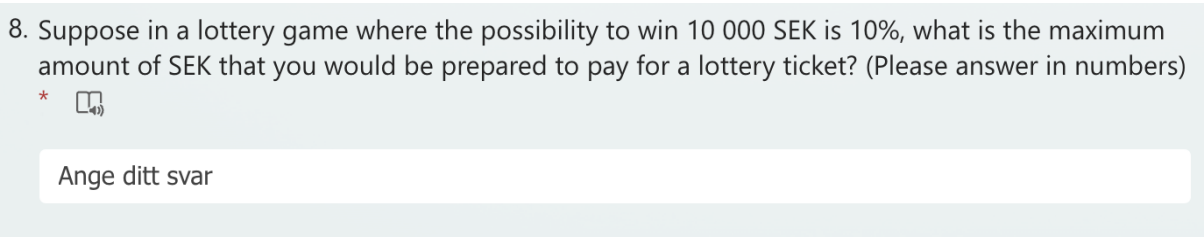
Question 6i. "If you instead were offered 4500 SEK, which of the options below would you choose?"



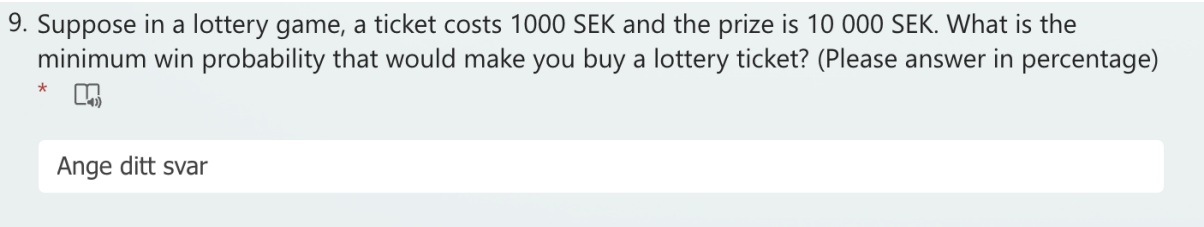
Question 7. "Suppose you have $5000 at your disposal and must invest it. Each alternative gives you an opportunity of return but with a risk of loss as well. Which one would you choose?"



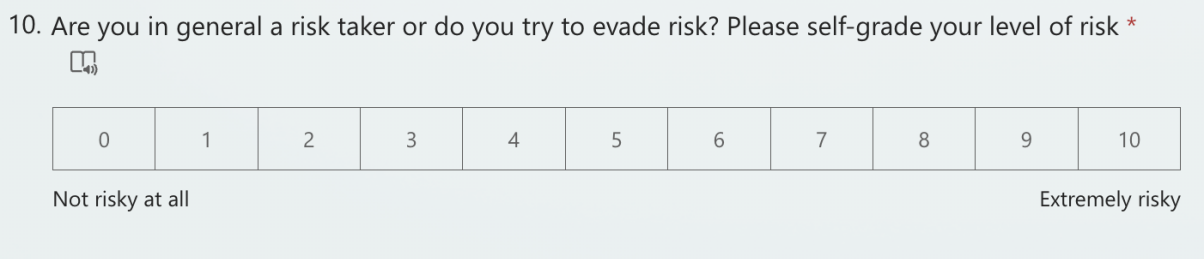
Question 8. "Suppose in a lottery game where the possibility to win 10 000 SEK is 10%, what is the maximum amount of SEK that you would be prepared to pay for a lottery ticket? (Please answer in numbers)"



Question 9. "Suppose in a lottery game, a ticket costs 1000 SEK and the prize is 10 000 SEK. What is the minimum win probability that would make you buy a lottery ticket? (Please answer in percentage)"



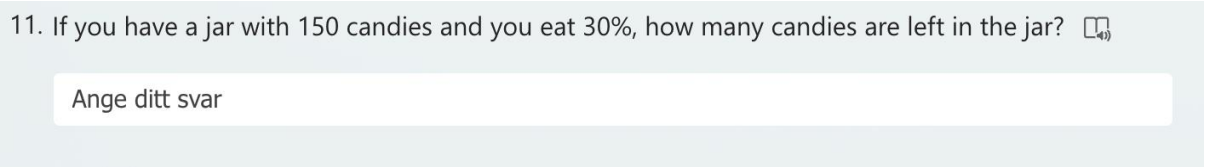
Question 10. "Are you in general a risk taker or do you try to evade risk? Please self-grade your level of risk"



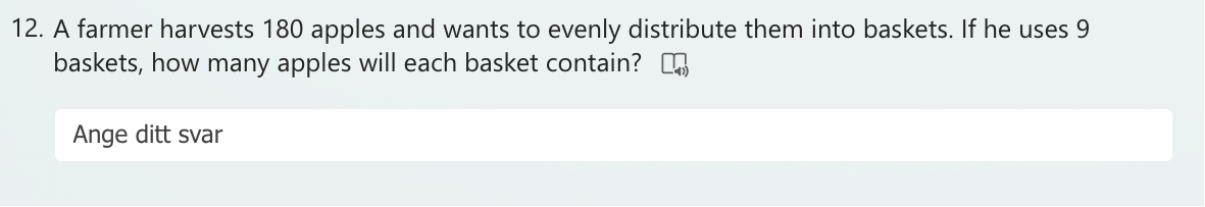
Appendix 1.4

This part is about numeracy

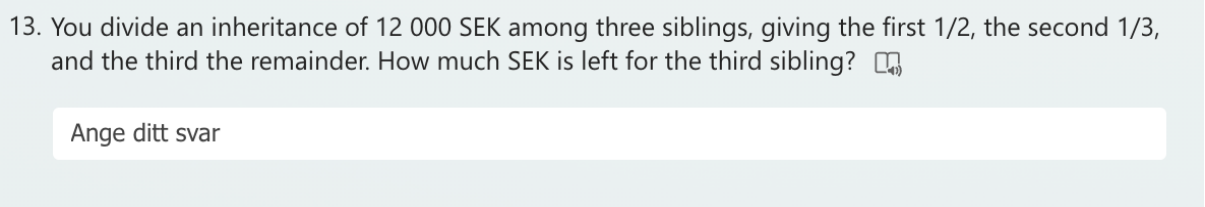
Question 11. "If you have a jar with 150 candies and you eat 30%, how many candies are left in the jar?"



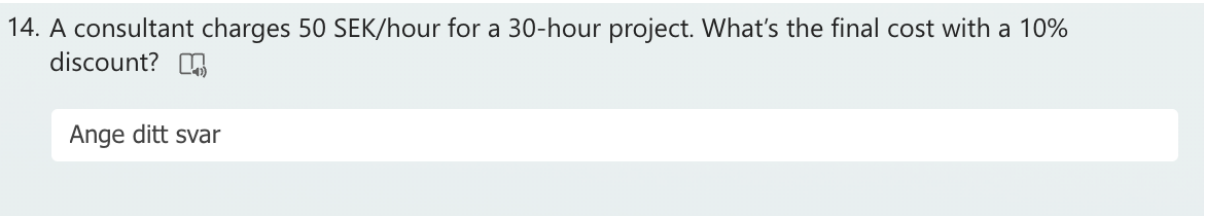
Question 12. "A farmer harvests 180 apples and wants to evenly distribute them into baskets. If he uses 9 baskets, how many apples will each basket contain?"



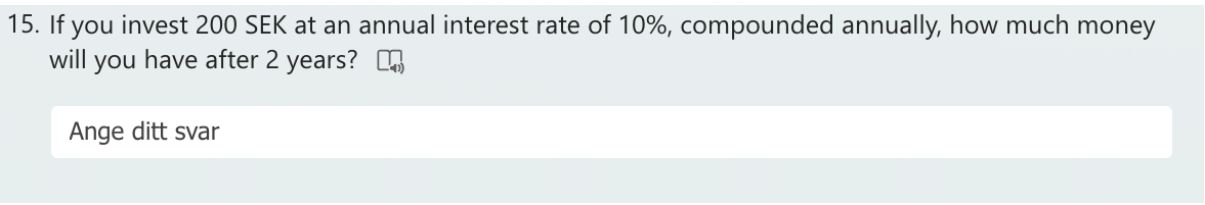
Question 13. "You divide an inheritance of 12 000 SEK among three siblings, giving the first 1/2, the second 1/3, and the third the remainder. How much SEK is left for the third sibling?"



Question 14. "A consultant charges 50 SEK/hour for a 30-hour project. What's the final cost with a 10% discount?"



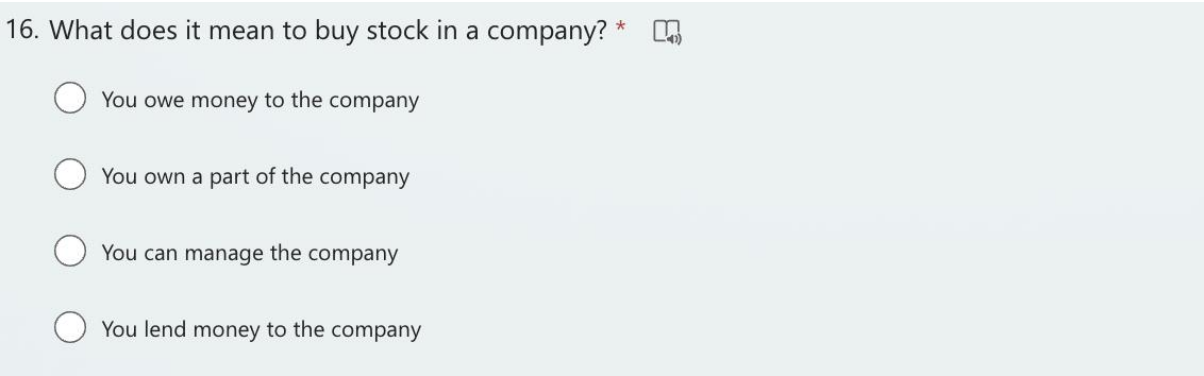
Question 15. "If you invest 200 SEK at an annual interest rate of 10%, compounded annually, how much money will you have after 2 years?"



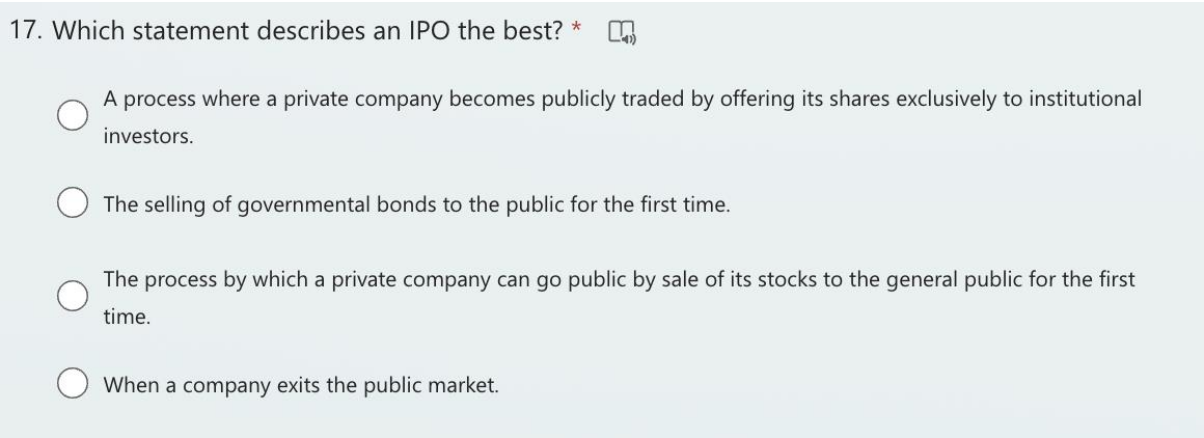
Appendix 1.5

This part is about financial literacy

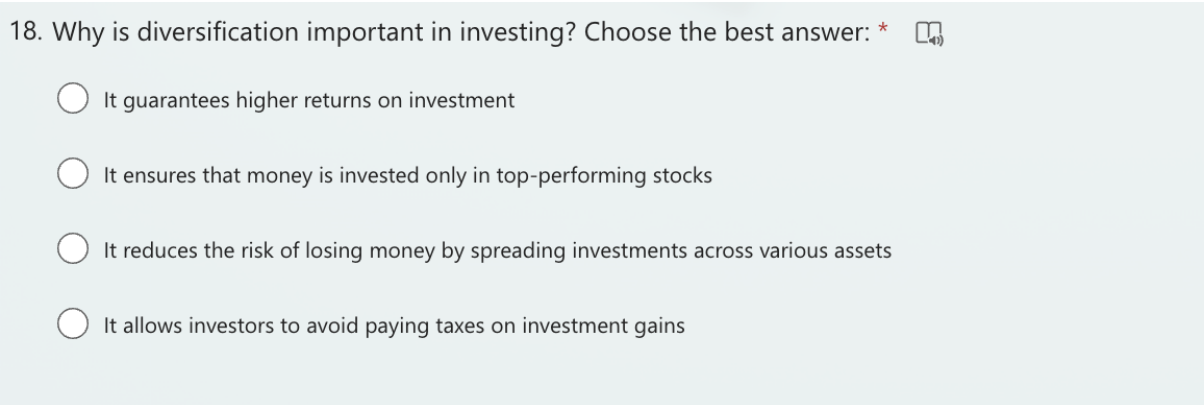
Question 16. "What does it mean to buy stock in a company?"



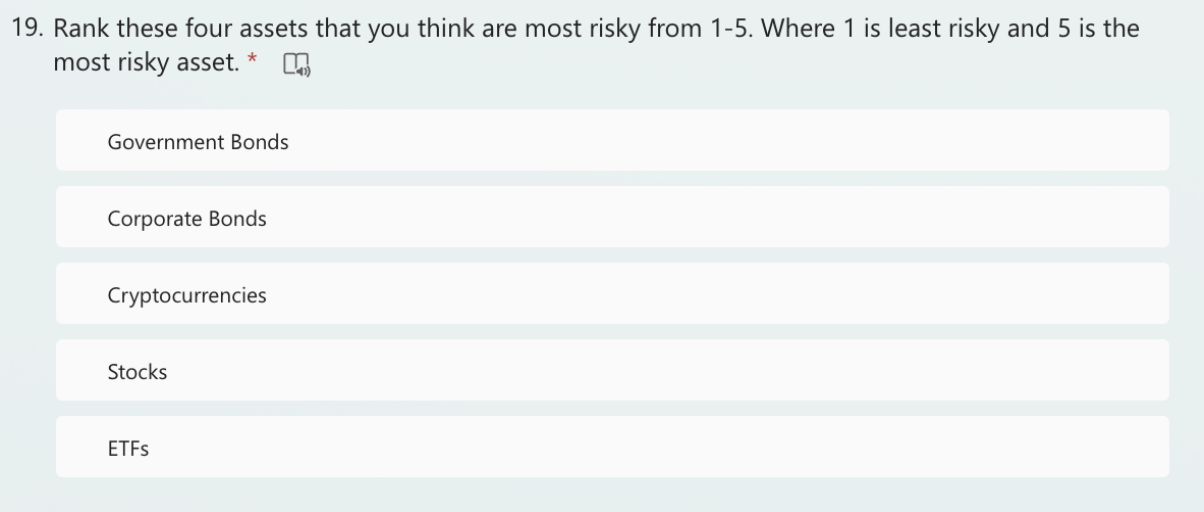
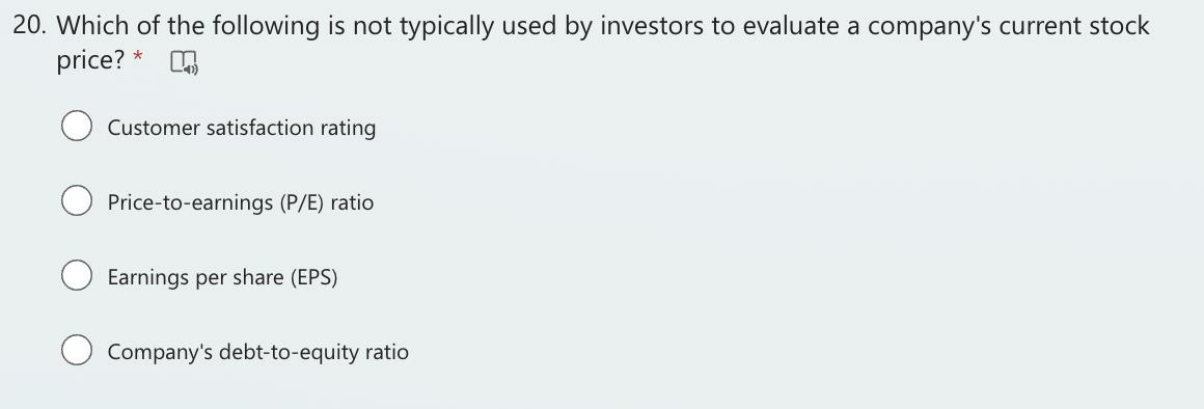
Question 17. "Which statement describes an IPO the best?"



Question 18. "Why is diversification important in investing? Choose the best answer:"



Question 19. “Rank these four assets that you think are most risky from 1-5. Where 1 is least risky and 5 is the most risky asset.”



Question 20. “Which of the following is not typically used by investors to evaluate a company's current stock price?”