Determinants of risk tolerance and investment behaviour:

A study of French and Swedish Business School students

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Abstract

Through this paper, our first wish is to study student’s investment behaviour and risk tolerance and the possible connection between these two concepts. By comparing the features of student investors with those of adults, we want to know if risk tolerance and investment behaviour biases arise after years of trading, influence of peers, evolution of marital status or if they are already present in young adults. Risk tolerance and financial behaviours are two concepts that should be analysed in order to understand portfolio decisions and market behaviour.

“What are the determinants of risk tolerance and investment behaviour of students and is there a relationship between risk tolerance and investment behaviour?”

In order to answer the research question, a quantitative process with a deductive approach was conducted. The data were collected from French and Swedish Business School students with the help of a questionnaire.

Various analyses on the possible influence of demographics such as gender, nationality, religion and field of study on the level of students’ risk tolerance and behaviour biases (overconfidence, cognitive dissonance and regret) were performed.

The empirical results showed that students don’t react as adults. Thus, neither nationality, nor gender, nor religion play a role in influencing their risk tolerance. Nevertheless, one significant relationship between field of study and the level of risk tolerance was observed. We concluded that the field of study might influence the risk tolerance of students.

With respect to investment behaviour, more correlations were discovered. If overconfidence is not influenced by our demographics, different levels of cognitive dissonance seem to be in relationship with student’s religion and field of study. Also, regret seems to be influenced by their nationalities, religions and field of studies. These findings appear to be in contradiction with previous research regarding the whole population. It may be evidence that students don’t react as adults when it comes to investment behaviour in the financial markets.

Finally, the last analysis suggests a possible relationship between risk tolerance and investment behaviour for students. The empirical results show that overconfident students have a high level of risk tolerance. Similarly, risk tolerant students own a high degree of cognitive dissonance.

All these results could be analysed more thoroughly by future scholars. Right now portfolio managers and brokers are only evaluating the risk profile of their customers before investing their money. However, if behavioural biases play a role in influencing the risk tolerance of investors, they also should be assessed. This would allow having a better understanding of investor’s psychology.
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1. Introduction

People are facing risk in their daily life. Willingness to take risk can be analysed by looking at someone behaviour in the street, on the road while driving and in many other cases. In finance, being aware of financial risk is an important matter to achieve investment goals. Risk tolerance and financial behaviour are two concepts that should be analysed in order to understand portfolio decisions. In the present thesis, we will study the correlation, with respect to students, between some demographics (gender, nationality, field of study and religion) and (i) risk tolerance and (ii) investment behaviour with a focus on three major biases: overconfidence, regret and cognitive dissonance. We will then investigate if there is a correlation between risk tolerance and investment behaviour for students. We start this thesis by an overall presentation of the main questions that motivated us to write this thesis: why are investment behaviour and risk tolerance interesting topics? Why are students interesting? Why should they react differently from others? How do we contribute to research? To practice? Then, we present the literature review, concerning risk tolerance and investment behaviour that has set the theoretical foundation of this paper. Finally, we analyse the main research gaps and formulate our research question and the purposes of this thesis.

1.1 Investment behaviour and its biases

In the last two decades, a new field known as behavioural finance has become to emerge in the finance industry. Today, lots of financial institutions propose financial services built on results based on behavioural finance. For example, contribution pension plans use findings grounded in behavioural finance in order to help people to invest their retirement money. Likewise, many hedge funds and asset managers use strategies based on behavioural finance in order to improve their investment strategies and their overall portfolio returns.

Behavioural finance, as its name would suggest, try to improve our knowledge of financial markets and its different participants by using expertise from behavioural sciences like sociology and psychology (Ricciardi and Simon, 2000, p. 1). This concept is in contradiction with the traditional finance paradigm, which aims at understanding financial decisions by supposing markets and its participants (named the economic agents) are rational, which means that they should act in order to maximize their self-interests (Ritter, 2003, p. 429).

Even if this concept sounds attracting and have been argued by many researchers, it involves strong assumptions regarding the financial markets and human behaviours. It supposes, for instance, that economic agents understand all the effects of their actions and that they fully integrate and process all the available information. Furthermore, it assumes that financial markets are stable (i.e. the fundamental value of a security is reflected by its price) and that traders correct the influence of irrational market participants (Barberis and Thaler, 2003, p. 1055).

However, it seems that financial markets and its participants do not have all of these characteristics (Kahneman, 1973, p. 238). People take choices that differ from those of rational agents: they may have social considerations, like not investing in tobacco firms (Kahneman and Tversky, 1979, p. 270), they have limitations to resolve complicated problems and they face difficulties to treat information (Simon, 1957). Moreover, traders are limited in their possibilities to correct non-rational behaviours (Barberis and Thaler, 2003, p. 1055). Consequently, classic finance theories may not reflect financial behaviour accurately. Many papers confirm this proposal and demonstrate that the traditional paradigm is too
restrictive. For example, bond and stock returns can be predicted by using macroeconomic variables and investor’s sentiment measures (Whitelaw, 1994, p. 522, Cremers, 2002, p. 1228, Avramov, 2004, p. 701, Baker and Wurgler, 2007, p. 129). Therefore, market prices don’t reflect all information. By contrast, numerous recent studies prove that behavioural finance theories can explain phenomena that the traditional finance theories can’t. For instance Daniel, Hirshleifer and Subrahmanyan (1998, p. 1839), Barberis, Shleifer and Vishny (1998, p. 307) give clarification about the low/high returns of stocks in the wake of bad/good earning perspectives. Also, Shefrin and Statman (1984, p. 255) prove that behavioural finance is able to explain why companies pay dividends despite dividends have tax disadvantages. Moreover, results from behavioural finance appear to be reliable in order to improve investment strategies for retirement (Benartzi and Thaler, 2004, p. 173).

Baltussen (2003, p. 32) demonstrates that behavioural finance can, in many situations, explain more accurately than the financial finance paradigm, the behaviour of financial markets and its participants. Many questions are still unresolved by this field of study. For instance, when do people become excessively pessimistic or optimistic? What consequences does it have on markets? How do people construct their portfolios? Given that behavioural finance is to be continued, we wanted to try to participate to the development of this field. Thus, we will analyse the correlation between three major biases of investment behaviour: overconfidence, regret and cognitive dissonance with some demographics: gender, nationality, religion and field of study. In addition, we found some previous works held on the possible relationship between risk tolerance and investment behaviour. It appears that some biases such as regret and overconfidence could have an impact on the risk tolerance of an individual. Given that investors risk attitude is elastic, it could change easily with economic and emotional factors. (Ackert, Church and Deaves, 2003, p. 33-39, Gervais et al., 2011, p. 1735-1777, Malmendier and Tate, 2005, p. 2661-2700). Further explanations about these investment biases and their possible influence on risk tolerance are detailed in the theoretical framework.

1.2 Risk tolerance and its determinants

Risk tolerance, an individual’s attitude towards withstanding risk, is an important component in investing. It impacts both financial service consumers and providers. For financial service consumers, risk tolerance is a key element to determine the optimal composition of assets in a portfolio with respect to the risk and the relative return (Droms, 1987, p. 114). For fund managers, Jacobs and Levy (1996, p. 10 - 16) demonstrate that the incapacity to efficiently determine investor risk aversion can create homogeneity among investment funds. In addition, Schirripa and Tecotzky (2000, p. 29 - 40) assert that it is possible to optimize the standard Markowitz portfolio optimization process by gathering investors with different risk tolerance into a single efficient portfolio by conserving the groups average risk tolerance.

In spite of its significance in the financial service industry, there are still some unsolved questions regarding the “determinants” of risk tolerance. Even if lots of factors have been tested, a brief literature review of the results shows a lack of consensus. Also, to the best of our knowledge, no papers are focusing on student risk tolerance and the possible connection between this last concept and investment behaviour. Thus, we will try to analyse this specific issue.

Each investor has his own level of risk tolerance depending on several factors. According to previous researchers, some demographics can significantly influence risk tolerance. They
found relationships between risk tolerance and gender. Thus, women should be more risk averse than men (Bajtelsmit & Bernasek (1996, p. 1), Powell and Ansic (1997, p. 605) and Grable (2000, p. 625-630). Then, individuals with higher education are generally more risk tolerant (Haliassos and Bertaut, 1995, p. 1110; Sung & Hanna, 1996, p. 11). For Cummings et al (1971), nationality can play a role in impacting the risk tolerance of someone. But according to Bartke and Schwarze (2008), nationality is not relevant to explain risk tolerance differences between countries. The differences observed are related to other factors such as religion. Religious people are in general more risk averse than atheists (Miller and Hoffmann, 1995, p. 63). Discrepancies are also found in risk taking behaviours among religions. Other determinants such as age or wealth can influence risk-taking behaviours. Nevertheless, we will not focus deeply on them, as there are determinants that can’t influence student’s attitude toward risk. Despite these findings, risk tolerance is a field of study very controversial and lots of researchers don’t find relationships with risk tolerance and these previous factors (find more details in the theoretical part of this thesis).

The goal of this current article is to find consensus about the following determinants concerning risk tolerance: gender, nationality and religion. We will also investigate a new demographic (field of study) in order to study if there is a relationship with risk tolerance. Previous findings show a relationship between the level of education of an individual and his risk tolerance. Here, we want to analyse if there is a specific link between the field of study attended by a student and its risk tolerance given that all our respondents are students from Business Schools, they are already part of the people with high level of education. As we test our demographics independently with risk tolerance and with investment behaviour, we will analyse if it is possible to find any relationship between risk tolerance and investment behaviour. Lastly, as it is explained in part 1.5 of this thesis (“Students’ risk tolerance and investment behaviour”), we will study if students react as the whole population when it comes to their investments.

1.3 A specific focus on students

Most of the researches dealing with risk tolerance and investment behaviours in industrialized societies try to explain the differences between some demographics inside a whole population. However, as far as we know, none of them specifically focus on undergraduate students. The present thesis will try to shed light on these topics given that people during the transition to adulthood (18 – 26 years old) react neither as adults nor as adolescents. They differ, for example, in moral decision-making, reasoning style, fairness and visual perception (Henrich et al, 2010, p. 61). They are also different from adults and children in the way they perceive risk (Arnett, 2000, p. 470). Risk taking during the transition to adulthood is a topic analysed by numerous researchers who try to explain the elevated degree of risk taking between childhood and adulthood (Arnett, 1992, p. 395; Romer, 2003). Recently, it has been recognized that hazardous risk taking behaviours (drugs use, unprotected sex) peak during this time of life. According to Arnett (2000, p. 470) in emerging adulthood (around 18-25), risk taking is a common element, especially in modern, industrialized societies.

All in all, people during the transition to adulthood (18-25) react differently than adults and adolescents. They are generally more risk prone than the others. In this way, this thesis will try to examine if students also react differently than adults when it deals with stockholding risk tolerance and investment behaviour. We will focus on students because they are in this period of life called transition to adulthood and are the more prone to invest given their educational background (Haliassos ans Bertaut, 1995, p. 1110). Also, during a first research
about stockholding among student investors at Umeå University, we found that the majority of students making investments are attending business studies. Therefore, we decided not to focus on the entire population of students but only on Business School students. By comparing previous results with the specific case of undergraduate students, we should be able to draw some guidelines about their risk aversion and investment attitudes.

1.4 Research gaps

After a brief literature review on the different parameters that affect risk tolerance and investment behaviour, some research gaps were found. Most of them are due to the fact that our research focuses on students. In fact, risk tolerance is a well-covered subject but at our knowledge, no previous researches were done on students. In addition, we will investigate a new determinant, field of study, to explore if there is any relationship between it and our concepts. Understand what affects students’ risk tolerance seems particularly useful given that students are investing an increasing amount of money on stock market. For investment behaviour, a very few amount of research analyse the correlations between our demographics and our three investment biases (as it can be seen in our theoretical framework). This is surprising for us because almost all investors present behavioural biases (Ricciardi and Simon, 2000, p. 1). Thus, we would like to participate to this field by getting a better understanding of factors susceptible to explain their origin and consequences. This thesis will try to shed light on these aspects by analyzing if students react as the whole population with respect to these parameters.

1.5 Significance of the research

This paper is a good reference to consider for stock-investors. Investing is not just analysing numbers and making decisions to buy or sell various assets (Baker and Ricciardi, 2014). It encompasses both technical and behavioral considerations. This thesis provides a comprehensive view of the main biases present in individuals. To be aware of their influence on our decisions could help investors to reduce them by defining clear strategies.

Scholars will also benefit from our study. Indeed, we want to analyze if students react as adults when it comes to risk tolerance. By comparing the features of student investors with those of adults we want to know if risk tolerance and investment biases arise after years of trading, influence of peers, evolution of marital status or if they are already present in the student years of an individual.

This paper is also destined to students. We want to show them the importance of savings for their future. Furthermore, our research will help them understanding their potential behavior biases and consequently avoid them to make investment mistakes in the future. Finally, we provide some guidelines to follow in order to limit their effects on future investments.

Also, lots of portfolio managers and brokers are nowadays assessing the profile of their clients based on their risk profiles. However, we believe that the behavioral profile of the client should be taken into account. If we determine that risk profiles are influenced by behavioural biases, every professional should also evaluate the levels of overconfidence, cognitive dissonance, and regret of their clients in order to find more relevant risk profiles.

Lastly, we also want to investigate through our questionnaire where students find their advice/information before investing and what are their purposes behind their stock portfolios.
This could be helpful for financial professional service providers because students could be part of a new generation of investors.

1.6 Research question

“What are the determinants of risk tolerance and investment behaviour of students and is there a relationship between risk tolerance and investment behaviour?”
2. Scientific methodology

2.1 Ontology

Objectivism states that social phenomena and their meanings exist independently of social actors (Bryman & Bell, 2011 p. 20; Saunders et al., 2012, p. 130). As the main purpose of this paper is to investigate the demographics influencing students’ decisions in the stock market – which are considered as external to the researchers and independent of their mind (Lagoard-Segot, 2015, p. 2) – objectivist approach appears to be more appropriate than constructionism. This latest ontological position asserts that social entities and their meanings are constructed and easily shaped. Therefore, it required studying the subjective meanings motivating the different social actors so as to comprehend their acts and their meanings (Bryman & Bell, 2011 p. 21). However, through this paper, all the demographics affecting student’s risk tolerance and investment behavior exist “out there” and can be considered as unique. At this end, constructionism doesn’t fit with our paper.

2.2 Epistemology

Epistemology deals with the nature of knowledge, or what is recognized as acceptable knowledge (Bryman & Bell, 2011, p. 15; Saunders et al., 2012, p. 132). Epistemology assumptions show the procedure that should be followed and the principles that rule the study of reality. One of the main questions within epistemology is whether we can employ the measures and procedures used in natural sciences in order to study the social world (Bryman & Bell, 2011, p. 15). There are four dominant orientations: realism, positivism, interpretivism and pragmatism (Saunders et al., 2012, pp. 134-137). The purpose of the positivist orientation is to produce general laws in order to predict behaviour (Fisher, 2010, p.19). We will follow this orientation, as our goal is to understand the determinants that influence different levels of risk tolerance and behavioural biases of student investors. Following a positivist position implies that knowledge can only be get by analysing social phenomena. This will be our case given that we will draw conclusions about student’s risk tolerance and investment behaviours from our observations based on our questionnaire. Positivist researchers also use measures and procedures from natural sciences (Saunders et al., 2012, p. 134) and don’t take a personal position but they are rather external observers. The creation of new theories is the consequence of testing hypothesis (Bryman & Bell, 2011, p. 15). For this matter, we will use a self-completion questionnaire, based on previous professional ones in order to collect our data. The research will therefore be conducted in a very neutral way. Then, the data will be analysed and tested with our hypotheses. Finally, our findings will confirm or reject previous theories.

2.3 Pre-understandings

According to Gilje and Grimen (2007, p.179), one of the fundamental suppositions within scientific philosophy is that it is very difficult to understand the world for researchers without pre-understandings. A significant part of an individual’s pre-understandings comes from his past experiences and his knowledge of a subject (Gilje & Grimen, 2007, p. 183). This has an effect on the way he understands the nature of the world (Hartman, 2004, p.191) and the interactions with other individuals (Gilje & Grimen, 2007, p. 183). If we fail to deal with our presuppositions, our results may be a reflected image of something existing in our pre-understandings. Our decision to study student’s financial risk tolerance and student’s...
investment behaviour arises from our financial background as well as our sharp interest for stock investment (we are both investing money on the financial markets and we wanted to understand what affect students’ investment) and our previous working experiences (one of us did an internship as a mergers and acquisitions analyst, the other completed an internship as a hedge fund valuation controller). We believe that our different experiences (we have lived outside France for more than two years, either for working or studying) is an undeniable asset for us in order to keep openness and objectivity in our thesis. In fact, we have met a lot of people from different horizons and cultures and it improved our open mindedness. Also, the different internships that we have done taught us to tackle a problem with integrity and objectivity. We have conducted a strong literature review and discovered lot of findings on our subject. It has helped us in conducting our research in the same way as similar studies, without any bias from our knowledge. Moreover, we based our survey on previous surveys held by professional to be sure that our pre-understandings will not get in the way of this thesis.

2.4 Literature review

We built our theoretical framework on previous research. For researchers, it is fundamental to select a broad and varied literature review that covers many aspects of a subject (Patel & Davidson, 2011, p. 69). In order to gain as many knowledge as possible, we started with a broad approach in our literature review by reading many papers related to risk and investment. Then, we narrowed our research by focusing on risk tolerance and investment behaviour that are the center of our thesis.

To determine validity and objectivity of sources employed is fundamental for researcher in order to effect quality of the thesis (Patel & Davidson, 2011, p. 69). In order to have as little bias as possible (Saunders et al., 2012, pp. 73-77) in this thesis, we have tried to analyse the content of the sources used in an analytical way. To find academic articles linked to our subject, we have used databases from Umeå University Library (EBSCO for example). Google Scholar has also been very useful for us to find relevant academic articles. Whenever we used Google School we always checked that the articles were peer-reviewed so as to ensure the relevance of the articles.

Using keywords is very helpful to find articles in a particular area (Ejvegård, 2003, p. 84). In our case, we used the following key words: risk tolerance, risk aversion, investment behaviour, financial biases, overconfidence, regret, cognitive dissonance, household stockholding, stock investment, stock market. We also looked for previous articles linked to our demographics. At this end, to sharpen our research, we also utilized the keywords: demographics, gender, income, wealth, nationality, education, and religion. We noted during our literature search that no article related to our area dealt with students. The most complicated part of our literature review was to find articles explaining why it was interesting to focus on students in the area of risk tolerance and investment behaviour. In this case, we searched articles linked to the words: transition to adulthood, risk taking between childhood and adulthood, risk taking during emerging adulthood, students’ risk attitude, influence of the professional world, evolution of the marital status, investment behaviour, investment behaviour biases.

Ejvegård (2003, p. 45) also argues that a good way to find good articles and books is to analyse researchers’ reference lists. During our research, we found out that some authors and
some articles were particularly used. Naturally, we decided to use these sources because they can be considered as works of reference in this area.

2.5 Research approach

A research, in order to be valid and easy to understand, needs to follow plans and procedures. Researchers have to choose the research approach that fits the best to go from their broad assumptions to detailed methods of data collection, analysis and interpretation (John W. Creswell, 2014, p. 3). The overall decision involves choosing this approach to study the desired subject. This decision has to be the philosophical assumptions the researcher are going to bring to the study; the research designs; and the research methods of data collection, analysis, and interpretation. The selection of a research approach has to be based on the research problem analysed, the writer’s personal experiences, and the potential respondents of the study.

Deduction, induction and abduction are three different methods that researchers can use to match related theory and empirical data (Patel & Davidson, 2011, p. 23). Deductive approaches develop propositions from current theories and make them testable in the real world by confirming or rejecting them. These approaches draw conclusions about individual phenomena (Patel & Davidson, 2011, p. 23). This method fits perfectly with our study. In our case, while reviewing previous theories made on risk tolerance and investment behaviour, we came up with hypotheses made by previous researchers. Thus, we decided to use a deductive approach in order to be able to confirm or reject these previous hypotheses.

For Inductive approaches, the theory is systematically generated by the data gathered (e.g., Glaser and Strauss, 1967). The researcher can with these data study the research object, without having made the survey according to a previously accepted theory, and formulate a theory (Patel & Davidson, 2011, p. 23). Since collection of data with an inductive approach is based on a particular situation, time, or group of people, there is a risk to don’t know anything about the theory’s scope (Patel & Davidson, 2011, p. 23). This approach is not suitable for our research because we go from theories to data analyses in order to confirm them. We are not conducting this study to develop new theories from data collection.

The abductive approach is a mixture of deductive and inductive approaches. An abductive approach is suitable if the goal of the researchers is to discover new findings — other variables and other relationships. An inductive approach is used during the first step then the hypothesis or theory is tested on new cases (Patel & Davidson, 2011, p. 23). For the second step, the researcher works deductively with the original hypothesis or theory and then develops and extends them to become more general (Patel & Davidson, 2011, p. 23).

In business research, after having chosen one approach, two main types of research process can be used: qualitative and quantitative (Bryman & Bell, 2011, p. 27; Saunders et al., 2012, pp. 159-161). The differences between these methods are mostly between the link of the theories analysed and research conducted, ontological considerations and epistemological assumptions of the researchers (Bryman & Bell, 2011, p. 26). In contrast to numerical methods used in natural sciences, qualitative research focus more on words and meanings analysis than numerical methods (Saunders et al., 2012, p. 163). For quantitative research, a deduction approach is often followed where the hypothesis are chosen according to the previous theories analysed (Saunders et al., 2012, p. 162). One of the particularities of a
quantitative research is that its results can be generalized to other populations (Bryman & Bell, 2011, pp. 163-165).

This paper, which focuses on students risk tolerance and investment behaviour, is done based on general theories about these concepts and their components. Risk tolerance and Investment behaviour are two subject already covered. We found previous theories made on these two subjects. However, as we know, no one is focusing on student respondents. The existing theories will allow us to decide which information are going to be collected, how to interpret them, and how to relate our results to them (Patel & Davidson, 2011, p. 23). The main benefit of using a quantitative research process with our deductive approach (see all the steps of our research process in Table 1), is that it will allow us to generate derived hypotheses which will confirm or reject the previous ones.

Table 1 - Quantitative research process (Bryman & Bell, 2011, p. 151)

<table>
<thead>
<tr>
<th>Step</th>
<th>Elaborate theory</th>
<th>Devise hypothesis</th>
<th>Select research design</th>
<th>Devise measure of concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>In analysing previous research, we found that there is a link between gender, religion, nationality and the risk tolerance profile of individuals. As this subject is already well covered, we decided to analyse these variables with students. For investment behaviour we only find previous research about gender. We will contribute to the field by doing a research about the correlation of the same variables as risk tolerance but with investment behaviour. At the end, we will try to find a relationship between the level of risk tolerance and the level of the investment biases of students.</td>
<td>Based on previous elaborated theories (step 1), we defined all the hypotheses that were found previously between the link of our variables and the risk tolerance and some with investment behaviour of an individual. In conducting this study, we will be able to see if the same hypotheses can be applied to a specific sample or if some variables, like influence from the peers in a professional environment or the evolution of the marital status of a person are more accurate in defining its risk tolerance and investment behaviour.</td>
<td>We are using a cross sectional design as we will use a survey in order to collect our data. The sample of respondents is fixed and the point in time also but various variables will be analysed</td>
<td>Our survey was constructed based on previously made professional surveys, in order to define the basic profile of our respondents along side with their level of risk tolerance and investment</td>
</tr>
</tbody>
</table>
behaviour. (Its construction is developed in the practical method part of this thesis).

<table>
<thead>
<tr>
<th>Step 5</th>
<th>Select research site</th>
<th>We decided to focus on students from French and Swedish Business School.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 6</td>
<td>Select research subjects</td>
<td>Our research subjects are students from French and Swedish Business Schools. We are discussing more about it in the part about our sample.</td>
</tr>
<tr>
<td>Step 7</td>
<td>Collect data</td>
<td>In order to collect our data we made a survey based on previous professional surveys. We used Google Docs, which provide free tools to constructs online surveys. We decided to do it on internet because of our wide sample of respondents. It will allow us to reach them quicker.</td>
</tr>
<tr>
<td>Step 8</td>
<td>Process data</td>
<td>We will first export our data from Google Docs to Excel. Then we will use the software SPSS to process them.</td>
</tr>
<tr>
<td>Step 9</td>
<td>Analyse data</td>
<td>We will perform t-tests and ANOVA tests</td>
</tr>
<tr>
<td>Step 10</td>
<td>Develop findings</td>
<td>We will develop our findings and see if there is any links between our variables and our concepts. After this we will be able to confirm or reject previous hypotheses.</td>
</tr>
<tr>
<td>Step 11</td>
<td>Write up conclusions</td>
<td>To conclude our study, we will speak about our hypotheses and if students are different from adults. We will explain if there is further research that can be done in this particular field of study, the limitations we encounter and our contribution to research and practice.</td>
</tr>
</tbody>
</table>

2.6 Research design

The research design chosen to conduct a study provides a framework for the collection and analysis of data (Bryman & Bell, 2011, p. 717). Thus, the research design should be adapted to the topic and the research question analysed. Different designs are available (Bryman & Bell, 2011, p. 68). When conducting an experimental design, hypotheses are constructed and tested with different samples and conditions, with a cross-sectional design, data are collected during one point in time but in more than one case in order to collect data with different variables. Close to this last design, the longitudinal design adds a variable of time where its fixed in a cross-sectional design. For a case study design, the research is conducted in a deeper way in one single case in order to get an in depth understanding of the case. In the same way, the comparative design is comparing different case studies.

More than one design can be suitable with a research, therefore it is possible to mix them in order to respond in the best possible way the requirements of the research. Through our
research questions, we want to gain a deeper understanding on the factors that affect risk tolerance and investment. The study will be conducted in different cases (Students studying in France and Sweden) but during one point in time. The information we are looking for are general information, therefore a case study is not reliable for us. We believe that a cross-sectional design will fit perfectly with our study. This research design, also called “Social survey design” will allow us to collect quantitative information from our sample of respondents. Various variables will be linked to our main subjects. We will then analysed the collected information in order to detect some patterns with the subjects and the respondents. Thus, with a cross-sectional design, we will be able to get an answer to our research questions and confirm or reject previous hypotheses made on the same subjects.
3. Theoretical framework

3.1 Key concepts

3.1.1 Theory of emerging adulthood

The theory of emerging adulthood (Arnett, 2000, p. 469 - 480) explains how in modern and industrialized society the transition to adulthood is experienced by incorporating socio historical influences. This theory argues that life in these Western societies, hold a unique stage during the emergence to adulthood, where individuals experience life not like adult nor as teenagers. In order to demonstrate why in that stage of life people are different with their risk behaviour, Arnett (2005, p. 235 - 254) describes four features that may influence risk taking behaviours: (a) experimentation due to identity exploration; (b) instability (relationships, residence, and academic/work status); (c) self-focus involving low degree of social control; and (d) optimism that can explain the ignorance of potential hazards. Furthermore, for Ravert (2009, p. 376 - 396) in that stage of life, people can see the opportunity to take certain risks.

For Tymula et al (2012) senseless choices could be explained by biological tendencies that act on the brains of midlife adults to learn and to be flexible. To be able to understand the differences in risk-taking between people from 12 to 90 years old, Tymula et al (2012) studied 135 persons using a gambling game in which participant could choose between winning a definite 5$ or taking the chance to win a much larger amount with the risk to get nothing at all. They found that age plays a significant role in the difference of risk taking behaviours. If the risks are known, midlife adults (18-25) are more risk averse than teenagers and adults but if the risks are unknown, it is the opposite. According to this last experience, emerging adults accept some uncertainty in not knowing in order to learn and to get new knowledge.

3.1.2 Risk and risk tolerance

The term “risk” is used in a lot of different contexts and it is complicated to find a general definition. Hillson (2001, p. 1) investigates different definitions of this concept and comes to the conclusion that risk can be separated in three different categories: risk as something negative, neutral or positive. Risk as something negative can be defined as “hazard, chance of loss, or chance of bad consequences or exposure to mischance” (Iruku, 1991, p. 2). A neutral definition of risk can be: “an uncertain event or condition that, if it occurs, has a positive or a negative effect on a project’s objective” (Project Management Institute, 2000, p. 127). A positive definition of risk is “an opportunity that one can manage in a deliberate way” (O'Malley and Pat, 1996, p. 203). According to Hillson’s categories of risk, this paper will have a neutral view of risk as the nature of the effects of financial investment are undefined and can implicitly encompass both negative and positive effects (Hillson, 2001, p. 1).

Grable (2000, p. 625) defines risk tolerance as “the maximum amount of uncertainty that someone is willing to accept when making a financial decision”. According to Yao et al (2005, p. 53) financial risk tolerance is “the willingness to take financial risk”. Sahin and Yilmaz (2009, p. 1) describe it as “the amount of uncertainty or investment return volatility than an investor is willing to accept when making a financial decision”. In this research, we will adopt Grable’s definition of risk tolerance, as students’ financial investments are financial decisions.
Each investor has his own level of risk tolerance depending on several factors. First, it is generally accepted that risk tolerance depends on gender. Several researchers demonstrate that women have a lower risk tolerance than men (Bajtelsmit & Bernasek, 1996, p. 1, Powell and Ansic, 1997, p. 605). However, Hanna, Gutter, and Fan (1998, p. 10 - 11) and Grable and Joo (1999, p. 54) argue that gender is not a relevant factor that determines financial risk tolerance. Other investigations expand the gender issue with the impact of marital status. Risk tolerance is lower for single females, followed by unmarried females, married males and finally single males (Yao and Hannah, 2005). Also, individuals without children are more risk tolerant than couple with children (Grazier and Sloane, 2008, p. 938).

Age, is a second demographic that is thought to determine risk tolerance. McInish (1982, p. 125); Morin and Suarez (1983, p. 1201) and Palsson (1996, p. 772) argue that risk aversion increase with years. However, this correlation is not necessarily linear (Bajtelsmit and Van Derhai, 1997, p. 62). Intuitively, this outcome can be explained due to the fact that young investors have a higher number of years to recover from financial losses due to risky investments. Nevertheless, recent papers show that age is not significant in explaining risk aversion (Wang and Hanna, 1997, p. 28; Grable, 2000, p. 625; Gollier and Zeckhauser, 2002, p. 197).

Education is another demographic that is frequently argued to increase financial risk tolerance. Several papers have point out that individuals with higher education are generally more risk tolerant (Haliassos and Bertaut, 1995, p. 1110; Sung & Hanna, 1996, p. 11). However, Cole and Shastry (2009, p. 2) prove that people with an educational background in finance will not be more risk tolerant than people with an education in another field of study. This paper is only comparing students in finance with other students. At our knowledge, except this paper, no researches are investigating the relationship between different field of study and risk tolerance.

Wealth and income are two linked elements that are thought to have a positive correlation on risk tolerance (Friedman, 1974, p. 210; Blume, 1978; Shaw, 1996, p. 627). However, for Bernheim et al. (2001, p. 837), the distinction is not always clear-cut. In fact, people with a good income can more easily undergo losses due to a risky investment.

Previous papers have also studied the influence of ethnicity, nationality and religion on risk tolerance. According to Sung and Hanna (1996), ethnicity is a demographic that determines risk tolerance. White people are more risk tolerant than black people and Hispanic people. However, Weber and Hsee (1998, 2016), argue that these differences don’t come from ethnicity. There are linked to other aspects such as the number of children (Gutter et al, 1999, p. 162).

Nationality is another factor that is hypothesized to impact risk tolerance (Cummings et al. 1971). However, Bartke and Schwarze (2008) believe that nationality is not relevant to explain risk tolerance differences between countries. The differences observed are related to other factors such as religion. Some papers show that religiosity is in general positively related to risk aversion (Miller and Hoffmann, 1995, p. 63). Miller (2000) indicates that being atheist in Western reflected risk-taking behaviour. Indeed, non-religious people tend to be more risk prone. However, in Eastern, being irreligious was not linked to risk tolerance since in these countries, being atheist was not considered as a risky behaviour. Nowadays, these discrepancies are still visible (Hilary and Hui, 2009, p. 455). There are also differences in risk
taking behaviours among religions. Muslims are less risk tolerant than Christians for example (Miller, 2000, p. 6). Some experiences have been made in order to analyse Protestants and Catholics separately. Protestant movement shows an opposition to gambling and lots of them see gambling as a guilty activity (Ozment, 1991, Ellison and Nybroten, 1999, p. 356). In contrast, the Catholic Church movement is tolerant with moderate levels of gambling and is less disapproving with these activities. Barsky et al. (1997, p. 537) demonstrate that Catholics are more risk tolerant than Protestants, but less than Jews.

3.1.3 Behavioural finance

As introduced in the introduction, the major issue in behavioural finance is to explain why the market participants - the economic agents - make irrational decisions contrary to supposition of rational market participants. These errors impact returns and prices, provoking market inefficiencies (like over or under-reactions to information) that can create market trends and in some cases crashes (Lin, 2010, p. 325-350). Some researchers had explained the causes of speculative bubbles with the use of behavioural framework (Liu and Song, 2001; Thaler, 1999 and Shiller, 1987). Market anomalies have been attributed to noise trading, overconfidence, mimicry, and lack of attention from investors or over optimism (Elze, 2011, p. 640). The field of behavioural finance applies insights from psychology to give us a better understanding of financial decisions and their consequences on stock prices. Slovic (1972, p. 779 – 799) asserts, “A full understanding of human limitations will ultimately benefit the decision-maker more than will naive faith in the infallibility of his intellect”.

Researchers in the field of behavioural finance collect “facts” (based on surveys, laboratory research, experiments or observations in a natural environment) concerning investment behaviour and arrange them in “super-facts”. It is possible to analyse the psychology of decision-making in many different ways. Kahneman and Tversky (1979, p. 263 - 291), the pioneers of behavioural finance, first investigated how people think and react. Nowadays, current researchers carry on to write on cognition. Additionally, they explore social psychology and emotion. According to De Bondt et al (2008, p.3), the major findings of behavioural finance can be categorized in three types of results. First, there is a list of predictable mistakes make by the economic agents. These mistakes depend on context but are however systematic. Researchers question psychological mechanisms in order to understand how the human mind functions. Another type of result deals with the dynamics of security prices. Noise traders (investors making decisions without the use of fundamental data) make systematic errors because they over-react to good and bad news and follow trends, provoking profit opportunities for experimented investors. The last type of findings is about how decisions processes influence decision outcomes.

Thus, according to this field, it is fundamental to take into account the true nature of investors (their bounded rationalities and their imperfections) in order to help them – as well as policy-makers – to make wise decisions.

3.1.4 Investment behaviour biases

Lots of biases were found during previous analyses held on investment behaviour, but in this thesis we are focusing on overconfidence, regret and cognitive dissonance.

Behavioural finance encompasses many biases. The vast majority of these biases don’t exist independently because deep interactions exist among them. The following list - which is not
exhaustive - corresponds to the most commonly biases faced by investors (Baker and Ricciardi, 2014): overconfidence, regret, financial cognitive dissonance, prospect theory, representativeness, disposition effect, familiarity bias, worry, anchoring, self-attribution bias, trend chasing bias (Ricciardi and Simon, 2000, p. 1). Others can be equally important with respect to a particular situation.

At our knowledge, a very few amount of research, unlike risk tolerance, examine the correlations between general demographics (gender, nationality, religion, field of study and risk tolerance) and these biases when it comes to investment. This is a surprising result for us because almost all investors present behavioural biases (Ricciardi and Simon, 2000, p. 1). Thus, we would like to participate to this field by getting a better understanding of factors susceptible to explain their origin and consequences. It may be helpful to give additional elements to reduce them. The main objective of this paper is not to study all the biases - because this field is very wide and relatively uncovered. Our aim is to investigate those that are prevalent among investors and exist almost independently (in order to have consistent results). According to these two criteria we will have a specific focus through this thesis on overconfidence, regret and cognitive dissonance (Ricciardi and Simon, 2000, p. 1; Shiv, Loewenstein, Bechara, Damasio, 2005, 435 - 439).

The overconfidence theory is indeed one of the major theories on investment behaviour biases. Overconfidence can be defined as “an overestimation of the probabilities for a set of events. Operationally, it is reflected by comparing whether the specific probability assigned is greater than the portion that is correct for all assessments assigned that given probability” (Mahajan, 1992, p. 330). As investors, we have a natural ability of failing or forgetting to learn from our past mistakes such as a bad financial decision. Some previously held studies and theories showed that men are more overconfident than women and that this overconfidence decreases with experience. A little research was conducted among students at the Stockholm University, about the propensity of a student to get a very good grade at the next exam. They found that men are more confident to get a very good grade than women (Bengtsson, Persson and Willenhag, 2004, p. 1). In this way, some researchers found that men have more self-confidence than women (Deaux and Farris, 1977, p. 59, Beyer and Bowden, 1997, p. 197) and that they have a better self-perception than women. When it comes to investment behaviour, Barber and Odean (2000, p. 261) find that women are less confident than men concerning their investment skills. Therefore, females trade less (45 percent less) and experience lower trading cost than men. The trading costs reduce women’s returns by 1.7 percent compared with 2.6 percent for men. Still in the financial matter, men argue that they are more talented than women (Prince, 1993, p. 175). The inefficiencies of the markets, could be explained by the fact that overconfident investors have the tendency to trade in high volume and therefore favorise speculative markets (Statman, Thorley, Vorkink, 2006, p. 1535), and speculative bubbles. Overconfident people underestimate the margins of error likely to be committed (Shiller 1997). Barber and Odean (2001), identified that an overconfident investor ignore the belief of rational investors because he is too proud of his own belief. Nolte (2006, p. 7) claim that overconfidence on the market is temporary and can arise after several trading successes. On the other hand, Lester et al (1989, p. 75) believe that overconfidence depends on the individual’s belief to succeed.

Financial cognitive dissonance is another fundamental element in behavioural finance. Morton (1993) argues that individuals feel anxiety and tension when they face conflicting beliefs. People try to reduce these conflicts (dissonances) in different ways. Either by justifying or rationalizing their choices or by changing their past opinions. This theory is
particularly present in the stock market through investors who change beliefs or investment styles to support their investments. A shining example occurred during the speculative bubble in Internet stock. Many investors changed their investment strategies: the ones who were following fundamental analysis (price / earnings ratio for example) decided to invest in Internet companies where fundamental analysis couldn’t apply because these firms didn’t have revenues and no financial track records (there were very young). The two ways to explain the change in their investment style are (i) these investors argued that in a “new economy” the traditional financial rules don’t apply and (ii) they ignored their traditional ways of investing and bought these stocks based on price momentum (Ricciardi and Simon, 2000, p. 1). The influence of gender, nationality, religion and field of study on cognitive dissonance has not been analysed - at our knowledge - by previous researchers when it comes to the specific field of finance. However, some papers investigate the impact of these demographics on cognitive dissonance (as a whole). Cooper (2007) claims that cognitive dissonance is experienced by individuals everywhere, it is not limited to a specific culture or country. However, different cultural values can lead to distinct cultural experiences. American and European people are both motivated by feelings of guilt and feeling of shame (they experience dissonance when they are rejected by others and disrupt social harmony) contrary to Asian people who are mostly motivated by feelings of shame (they face dissonance when they breach either a social standard or a personal standard). For the influence of religion, according to Barlett, Drew, Fahle & Watts, (1974) individuals with religious orientation and beliefs accept information that satisfies their beliefs and reject the other. They have a tendency to self-justify their beliefs when contradicted (Batson, 1975; Mahaffy, 1996). Self-justifying behaviour could cause cognitive dissonance (Aronson, Turner & Carlsmith, 1963; Mahaffy, 1996).

Lastly the theory of regret stipulates that people assess their expected reaction to a future situation. Bell (1982, p. 961 - 981) defines regret as “the emotion caused by comparing a given outcome or state of events with the state of a foregone choice”. For example, “when choosing between an unfamiliar brand and a familiar brand, a consumer might consider the regret of finding that the unfamiliar brand performs more poorly than the familiar brand and thus be less likely to select the unfamiliar brand” (Inman and McAlister, 1994, p. 423). Further example is when investors avoid selling one of their stocks that has declined in value in order to avoid the regret of having made a bad investment choice and therefore report a loss. To reduce such a bad feeling about this last scenario, the investor can purchase the “hot or popular stock of the week” to follow the crowd of investors who did the same. In this case, if the stock declines, the investor will rationalize his investment choices more easily. He will reduce his emotional reactions or feelings (regret or anxiety) since lots of investors lost money on the same bad investments (Ricciardi and Simon, 2000, p. 5). Sugden (1985, p. 77 - 99) argues that regret depends on two elements. The first one is linked to a subjective evaluation of the quality of the decision taken. The second element is related to the evaluation of an outcome that may have occurred. However, according to Ritov and Baron (1995, p. 127), omissions (when the individual don’t know the result) are lower compared to actions. In this way, investors who take risky investments should follow their investments daily.

3.1.5 Relationship between risk tolerance and investment behaviour

For Thaler and Johnson (1990, p. 643-660), the risk attitude of a person is elastic and easily changeable. Other research find that the risk tolerance of an individual can be influenced by economic and emotional factors and that his risk tolerance changes according to his current
mood (Ackert, Church, and Deaves, 2003, p. 33-39). All of these changes in risk attitudes can be explained by the theory of regret explained above. “Regret theory rests on two fundamental assumptions: first, that many people experience the sensations we call regret and rejoicing; and, second, that in making decisions under uncertainty, they try to anticipate and take account of those sensations” (Loomes and Sugden, 1982, p. 820). The feeling of regret is stronger than the feeling of joy, thus investors tend to avoid regret situations. For example, when the stock market is going up and that the consensus agrees that it will keep going this way, investors tend to adapt their risk tolerance and invest in it in order to avoid missing potential profits. In the opposite scenario, the risk tolerance can be decreased, as the investors don’t want to keep a stock losing value and have to deal with the regret associated with this fall in value. MacKillop (2003, p. 62-64) believes that investors are more likely to change their risk tolerance in accordance to the direction of the fluctuation of the market. In the same way, Shefrin (2000) explains that recent fluctuations in the market exert strong influences on the risk tolerance of professional investors. When it comes to overconfidence, according to Pan and Statman (2010, p. 1 - 28), the risk tolerance of an investor can be influenced by his overconfidence. An overconfident investor under evaluates risk. Thus, overconfident investors tend to be more risk tolerant than the others. Following the results of the tests held by Gervais et al. (2011, p. 1735-1777) and Malmendier and Tate (2005, p. 2661-2700), overconfident CEOs tend to be less conservative and are more likely to invest in “money burning investment”.

3.1.6 Relationship between stockholding and demographics

We will develop in this part, the differences in stockholding according to various demographics. Thus, we will be able to explain, if needed, the difference in representation of the demographics in the results of our questionnaire.

There is a difference in stockholding between countries (Guiso, Haliassos and Jappelli, 2002). In the United States and Sweden half of the population invest in stocks. In France, the percentage decreases to 20%. Guiso, Haliassos and Jappelli (2002) explain these differences by both the correlation of wealth and stockholdings (entrance costs are less expensive if a large amount of money is invested) and the link between the amount of stocks held by governments, banks and holding companies. It appears that stocks are much more available in the UK, for example, where the government holds 5% of stocks than in France where 35% of stocks are held by government, banks and holding companies.

Some researchers also find relationship between savings and financial education (Bayer, Bernheim & Scholz 1996; Greenspan, 2001). Beverly and Sherraden (1999, p. 457) state, “The extent to which an individual understands the process and benefits of asset accumulation is likely to affect his willingness to save”. Similarly, Boyce, et al (1998) believe that financial education for high school students affect positively teenager financial knowledge and savings behaviour. Therefore, teenagers with a financial background will be more willing to save during their adult lives (Bernheim, Garrett & Maki, 2001, p. 435; Bayer, Bernheim & Scholz, 1996).

Religion has been identified as an important parameter in economical behavior. Iannaccone (1998) and Guiso et al (2003) find that religiosity is linked to a higher level of saving. Arruñada (2010, p. 890 - 918) explains that the Catholic work ethic supports saving, by lowering excessive consumption. Likewise, Renneboog and Spaenjers (2011) conclude that
“Catholics and Protestants consider themselves more trusting, care more about leaving money to their children, and have longer planning horizons than non-religious households”.

When it comes to Gender, we found few previous researches on the subject. Nevertheless, it seems that women, on average, are less investing in stock markets than men (van Rooij et al. 2011). It could be explained by the fact that usually, women are less financially literate than men (Lusardi, 2008, p.413-417).

3.2 Hypotheses

Despite a lack of consensus from previous papers on the factors influencing risk tolerance, we will analyze the three main demographics that we believe could affect student’s risk tolerance: gender (Bajtelsmit & Bernasek, 1996, p. 1, Powell and Ansic, 1997, p. 605), nationality (Cummings et al. 1971) and religion (Miller and Hoffmann, 1995, p. 63; Hilary and Hui, 2009, p. 455). We can note that we won’t focus on income and age as we focus on students. We will also investigate if field of study – a demographic hardly taken into account by scholars - could be responsible for different levels of risk tolerance. Given that education is frequently argued to increase financial risk tolerance (Haliassos and Bertaut, 1995, p. 1110; Sung & Hanna, 1996,p. 11) we expect to observe discrepancies related to field of study. We will test each of these demographic and compare our results with previous findings in order to see if students follow the same patterns as adults when it comes to risk tolerance.

Hypothesis 1: Demographics such as gender, nationality, religion and field of study are related to different levels of student’s risk tolerance.

Our second analysis will focus on the same demographics. This time, we will investigate their relationship with three behavioural biases: overconfidence, cognitive dissonance and regret. Given that very few papers – contrary to risk tolerance - study the correlation of our demographics with investment behavior, we hope that this paper will benefit to the field of behavioural finance.

Hypothesis 2: Demographics such as gender, nationality, religion and field of study are related to different levels of student’s overconfidence.

Hypothesis 3: Demographics such as gender, nationality, religion and field of study are related to different levels of student’s cognitive dissonance.

Hypothesis 4: Demographics such as gender, nationality, religion and field of study are related to different levels of student’s regret.

The correlation between risk tolerance and investment behaviour is not clear despite they are basic characteristics of investors. At first sight, risk tolerance seems to affect investment behaviours. In fact overconfident traders invest in risky assets (Barber and Odean, 2001). Thus we believe they are highly risk tolerant. Similarly, investors with a high level of cognitive dissonance don’t hesitate to invest in promising sectors (new technologies) even if they can’t apply their traditional strategies (if individual invest in new technology firms, fundamental analysis can’t apply because most of these companies don’t have revenues or financial tracks). We consider them as risk tolerant investors in the way that they invest in unknown and risky sectors.
Hypothesis 5: There is a relationship between risk tolerance and investment behaviour of students.

3.3 Conceptual model

The figure 1 represents our conceptual model and helps to understand what is investigated in this research. Its foundation is based on previous research held in this area. The influence of our demographics (gender, nationality, religion, field of study) will be tested with different levels of risk tolerance, overconfidence, cognitive dissonance and regrets. We will also study if there is a relationship between risk tolerance and investment behaviour.

![Figure 1: Conceptual model](image)
4. Practical method

4.1 Data collection methods

While conducting a research, primary data or secondary data can be collected (Saunders et al., 2012, p. 304). If new data are collected for the purpose of the research, these are primary data (Saunders et al., 2012, p. 304). If the data used for the basis of the analysis of a research were already collected for others previous research, they are called secondary data and they can be in the form of annual reports, historical tables or financial statements (Bryman & Bell, 2011, p. 312; Saunders et al., 2012, p. 304). In both qualitative and quantitative research, the sources of data can be primary (Saunders et al., 2012, pp. 304; 307). An advantage of primary data is that the collection is designed specifically for the purpose of the research conducted and therefore fits the research question (Bryman & Bell, 2011, p. 320; Saunders et al., 2012, pp. 319-320). Though, disadvantages are that primary data collection can be expensive and time-consuming (Saunders et al., 2012, p. 317). Given our research question, we would like to analyse if our demographics are related to risk tolerance and investment behaviour. These variables were never tested on students, therefore we will collect primary data.

After evaluating various methods that we will be able to use, we decided to conduct a survey for our data collection method. Our research question concerns generalization, and to answer it we decided that a questionnaire would be the most suitable method. A questionnaire is relatively cheap and easy to administer (Bryman & Bell, 2011, p. 232). Questionnaires are a method to collect data through asking the same questions in a prearranged survey to a sample of respondents (Saunders et al., 2012, p. 416). The use of questionnaire is a common and efficient method to reach a large sample and gather all of the information. As our population is wide (Business school students from France and Sweden), we believe that the use of a questionnaire will be the best way for us to collect the data we need for our thesis. One disadvantage though, is that as the respondent of a questionnaire is not known by the researcher, it is impossible to get back to him to have more information (Saunders et al., 2012, p. 419). That is why we developed and we pretested our questionnaire long before sending it. Pre-testing allows improving the questionnaire in fixing any problem the respondents may encounter while answering the questions (Saunders et al., 2012, p. 451). According to Shiu et al. (2009, p. 65) it is important to pretest the questionnaire on individuals that are representative of the targeted respondents. Thus, we asked students from Business Schools to try our questionnaire and to report us any problems they met or any unclear questions or answers they found. We then fixed everything that was reported. Therefore the questionnaire was not changed after being send to our sample. Finally, As Saunders et al. (2012, p. 420) state, we made our questionnaire in accordance with the research question analysed and the purpose of the study.

4.2 Style of questionnaire

As the theories used in this study are already covered but the sample of respondents is new, no data were available to answer our subject. Therefore we decided to create a survey based on previous professional made surveys. For Saunders et al. (2012, p. 431), using previously made surveys allow researchers to compare their findings with previous ones and assess reliability. Lots of financial institutions are using surveys in order to understand the risk tolerance profile of their customers (Grable 1999, p. 163; Reddy, 2010, p. 2; Sharieff, 2010, p. 75; BMO Insurance, 2009, p. 2; Schwab, 2014). These surveys were tested, developed and
are widely used by professionals. As we wanted to analyse risk tolerance, we used the same type of questions as the previously mentioned surveys in order to be more accurate. We also added questions regarding investment behaviour based on previously conducted questionnaire link to this topic (Zaiane and Abaoud, 2009, p. 18) or on experiments held by researchers (Ricciardi and Simon, 2000, p. 1). The survey uses basic financial vocabulary for the questions and the answers because we didn’t know the investment knowledge of the person responding and we wanted that all the respondents understand it correctly. All of the questions are compulsory multiple choices questions. This type of questions helps to guide the respondents and allow us to get information useable. We also used a ranking system developed by professionals: each answer with respect to risk tolerance, overconfidence, cognitive dissonance and regret was allocated to a certain number of points (Grable and Lytton, 1999, p.163; Schwab, 2014, p. 1). With respect to the answers, we established a risk tolerance profile (risk averse, balanced risk profile or risk tolerant) and a level of overconfidence, cognitive dissonance and regret.

Four constructs were incorporated in the questionnaire with a total of 20 items. The survey was divided into 5 parts covering (i) the personal details of the respondents - (see Appendix A, questions 1 to 9), (ii) their risk tolerance (Appendix A, questions 10 to 13), (iii) their overconfidence (Appendix A, questions 14 to 16), (iii) their regret (Appendix A, questions 17 and 18) and (iii) their cognitive dissonance (Appendix A, questions 19 and 20). In the first part of the questionnaire we asked questions to have general information about the respondents - including questions with respect to our demographics: gender, religion, nationality and field of study.

We wanted only participants who are studying in a Business School in France or in Sweden and who are investing money directly in the stock market. As we are looking to examine their behaviours, they have to make their own choices of investment, thus analysing the results of a student investing via a professional (mutual fund for instance) is not accurate for us. That is why we didn’t keep the data from students who invest indirectly. Thus, the questions 1,2 and 7 end the questionnaire if a “No” is answered because the respondent’s profile doesn’t meet our requirements. The second part of the questionnaire (question 10 to 13) allows us to draw the risk tolerance profile of the respondent. We picked up these questions from the survey of previous researchers: question 10 is based on Grable (1999, p. 163), questions 11 on Reddy (2010, p. 2) and question 1 on BMO insurance (2009, p. 2). We chose these specific questions because they are complementary and enable us to have a comprehensive risk profile. One (question 10) describes the investment experience of the respondent, another (question 11) the capacity of the respondent to tolerate a decrease of the value of its portfolio, and the last one (question 12) its preference to chose one portfolio rather than another in function of different returns and losses. The last part of the questionnaire (questions 14 - 20) is about the investment behaviour of the respondent. Given that we wanted to have details about three investments biases, we asked different questions. Questions 14, 15 and 16 deal with overconfidence. Question 14 is about general confidence of a student (how does he feel compared to the others). Question 15 deals with his confidence to beat the market in the next three months. We asked question 16 to know the stock holding period of students. According to Barber & Odean (2001), when investors are overconfident, they are inclined to overtrade. Based on this question, we can expect a significant relation between self-confidence and trading frequencies. Questions 17 and 18 are about cognitive dissonance. They allow us see if - facing conflicting beliefs - the respondents change their opinions or rationalize their choices. In questions 19 and 20, we analyse two concepts of the theory of regret. The question 19 analyses the level of regret linked to a missed opportunity of investing in a
profitable investment. Question 20 focuses on the reluctance to report a loss. Theory of regret deals with investors who prefer leave their losses going than sell their shares and report losses.

The survey is a self-completed web-based questionnaire. We made it from Google Docs. Due to the fact that our respondents study in various places in France and Sweden, postal questionnaires would be too costly and time-consuming for us.

4.3 Sample

There are two main methods of choosing an appropriate sampling technique for a quantitative study, probability sampling and nonprobability sampling (Bryman and Bell, 2011, p. 176). We decided to use a convenience sampling, which is part of the non-probability. We chose non-probability sampling because we couldn’t approximate the population that will be part of our sample (Churchill and Iacobucci, 2005, p. 326). Then, a convenience sampling, in order to reach accessible and available respondents for us.

We have chosen to focus on student from French and Swedish Business Schools (see introduction). Going back to our previous research results, we were very surprised to see that lots of Swedish students already investing in stock markets. After further research, it appears that Sweden is one of the Tier 1 countries in the world where the most households invest money in stock markets alongside the United States (Guiso, Haliassos, Jappelli, 2002, p. 131). It can be explained, on one hand, that Sweden is considered to have one of the best pension system in the world. In 2000, the Swedish government chose to switch its “pay as you go” national retirement program with a new pension program where part of the Swedish workers income are invested in financial markets via pension funds (Karlsson, Massa, Simonov, 2006, p. 4). With this new system, the government launched a massive advertising campaign all over the country, which created a positive image of investing in financial markets (Karlsson, Massa, Simonov, 2006, p. 5). According to Christelis, Georgarakos and Haliassos (2010, p.21), owners of retirement accounts are more likely to hold stocks directly. Thus, it is understandable that Swedish households level of stockholding is among the highest in the world. In addition, Sweden mastered a quick recover from the last economic crisis. As Stephan (2015, p.276) explains, Sweden has learned its mistakes from the financial crisis, which happened in the country twenty-five years ago. Since then, the economy and the major companies are much stronger. Swedish households are more confident in their country and their companies. According to Guiso, Haliassos and Jappelli (2003, p. 132), France is a country with a low rate of household stockholdings in Europe. It can be partially explained because France is one of the country with the largest social security system, “Household stockholdings are larger where the social security system is less generous” (Guiso, Haliassos, Jappelli, 2003, p. 132). Furthermore, a low stock holdings participation in this country can also be explained by a low financial and computer literacy and financial transparency in comparison to Sweden (Guiso, Haliassos, Jappelli, 2003, p. 157). Given these last facts, it appears pretty obvious that France and Sweden are two countries very interesting to compare within our research. Furthermore, it will be more practical for us to reach our respondents in these two countries. To accomplish this we will send it to different Business Schools in France and in Sweden.

For students from Umeå School of Business and Economics, ICN Business School and Burgundy School of Business, as we are students in all of these three schools, it will be easy for us to reach potential participants, with the help of our teachers. For other schools in
France and in Sweden, we will contact deans, teachers and head of research. We will send them a descriptive email with all of the information about our research, why we need their help and a direct link to our online survey. We hope they will be comprehensive and that they will answer positively to our request. In order to reach potential respondents, we don’t want to use any kind of social medias.

4.4 Quantitative data analysis

To analyse the data collected we exported them from Google Drive to Excel and to SPSS, a statistical analysis software (Saunders et al., 2012, p. 473). According to Bryman and Bell (2011, p. 334) it is important to keep in mind how the researcher will analyse the data prior to collect them. Thus, we are going to explain the statistical tools used to analyse our collected data. By using SPSS to analyse our data, we will be able to measure the effects of gender, religion, field of education and nationality on the risk tolerance and investment behaviour profile of the respondents. For this, Cronbach’s Alpha, t-tests and ANOVA tests will be used.

4.4.1 Cronbach’s alpha

Saunders et al., (2012, p. 430) and Ejvegård, (2003, p. 70) stated that a measure to be valid and useable should be reliable. Complete reliability is compulsory for a measure to be valid (Patel and Davidson 2011, p. 102). Reliability is linked to internal consistency, which means that the answers must be correlated to the questions of the questionnaire and that therefore the constructs are consistent (Saunders et al. 2012, p. 430). The most widely used method, among others, to calculate the coefficient of reliability is Cronbach’s Alpha (Saunders et al. 2012, p. 430). The alpha coefficient is between 0 and 1 (Saunders et al., 2012, p. 430). An alpha of 1 describes a perfect correlation between the data collected and the concept measured. To be acceptable, the value of the alpha must be above 0.80 in order to determine that the same things are measured by the scales combined, nevertheless for researchers, an alpha above 0.7 is acceptable (Bryman & Bell, 2011, p. 159). In other words, we must have a Cronbach’s Alpha above 0.7 in order to have data useable for our study.

4.4.2 Descriptive statistics

To find the average value of a population, the mean is used. The mean is computed by summing all the values from a population and divided by the total number of this population (Alm & Britton, 2007). Moreover, the Standard deviation is a tool that measures the variation or the distribution of the values of a population (Alm & Britton, 2007). The standard deviation gives an indication of the distribution around the mean (Alm & Britton, 2007). In order to test our hypotheses, we used a t-test and a one-way ANOVA test. A t-test is a method that compares means between two groups (Miller, 1997) and this method has been used to find if there were any differences between our demographics such as gender, nationality and our concepts (Risk tolerance, overconfidence, cognitive dissonance and regret). To test the possible differences between religion, field of study and our 4 concepts ANOVA has been used. An ANOVA test has the same structure as a t-test but it is possible to test between more than two groups (Miller, 1997). The significance level that has been used in the statistical analysis is 5%. Before to examine our data with t-tests or one-way ANOVA tests, an important part of the process requires to check if our data can be analysed with these kinds of tests. In fact, we can actually use these two tests if our data meet six different assumptions (there are the same for the two tests) in order to have reliable results (Lund and Lund, 2013).
· **Assumption 1**: Our dependent variables (risk tolerance, overconfidence, cognitive dissonance, regret) must be interval / ratio variables. It means that the distances between categories are identical (Bryman and Bell, 2011). Thanks to our ranking system, we allocated to the respondents a certain number of points for each variable. Therefore, there are interval / ratio variables.

· **Assumption 2**: Our independent variables (gender, nationality, religion, field of study) must consist of two (for the t-tests) or more (for the one-way ANOVA tests) categorical. Our independent variables consist of categories that can’t be ordered (Bryman and Bell, 2011, p. 381). Therefore there are categorical.

· **Assumption 3**: There must be independence of observations (a respondent must not be in two or more groups). We have independent groups (you are either a male or a female for example) so this assumption is met. We can note that none of our participants has the double-nationality French and Swedish.

· **Assumption 4**: There should be no significant outliers. We use rating scale answers in our questionnaire, thus we can’t have outliers.

· **Assumption 5**: Our dependent variables must be approximately normally distributed for each group of the independent variables. We tested this hypothesis using Shapiro-Wilk's tests on SPSS. In this tests the “Sig.” value of our dependent variables must be higher than 0.05. The results found are presented in the table 2. We often violated this assumption but we conducted the tests without considering it because ANOVA and t-tests are still robust under application of non-normally distributed data when the different sample sizes are not small (> 10) (Schmider et al, 2010, p. 150; Sawilowsky et al, 1992, p. 352-360).

<table>
<thead>
<tr>
<th>Independent variables</th>
<th></th>
<th></th>
<th></th>
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</tr>
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<tr>
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<td></td>
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<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Female</td>
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<td>0.000</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.018</td>
<td>0.001</td>
<td>0.000</td>
<td>0.003</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unaffiliated</td>
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<td>0.001</td>
<td>0.000</td>
<td>0.001</td>
</tr>
<tr>
<td>Catholic</td>
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<td>0.005</td>
<td>0.000</td>
<td>0.025</td>
</tr>
<tr>
<td>Protestant</td>
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<td>0.002</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td><strong>Field of Study</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting / Finance</td>
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<td>0.003</td>
<td>0.000</td>
<td>0.002</td>
</tr>
<tr>
<td>Marketing / Communication</td>
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<td>0.083</td>
<td>0.000</td>
<td>0.003</td>
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<tr>
<td>Economy / Strategy / Stats</td>
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<td>0.024</td>
<td>0.000</td>
<td>0.003</td>
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<tr>
<td>Management</td>
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<td>0.003</td>
<td>0.000</td>
<td>0.016</td>
</tr>
<tr>
<td>Risk tolerance</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk averse</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.002</td>
</tr>
<tr>
<td>Balanced risk profile</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.002</td>
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<tr>
<td>Risk tolerant</td>
<td>0.004</td>
<td>0.000</td>
<td>0.000</td>
<td>0.038</td>
</tr>
</tbody>
</table>

Table 2: “Sig.” values found using Shapiro-Wilk's tests
Assumption 6: Homogeneity of variances is required. We tested this hypothesis using Levene's tests on SPSS. In this test, the value found must be higher than 0.05. All our outcomes are presented in the table 3. This assumption is fundamental because in function of the results found we will have to perform specific tests. For the t-tests, if we found a value above 0.05, we performed a t-test and if the value was 0.05 or less (it means that we violated the assumption of homogeneity of variances), we conducted a Welch t-test because our design is not unbalanced (there is not a significant difference of participants between our different groups). For the one-way ANOVA tests, if the value was higher than 0.05 we did a one-way ANOVA and potentially tukey post-hoc tests (if we found statistical differences, the post-hoc tests tell us which of our conditions is materially different from each other). If the value of our homogeneity test was lower than 0.05, we performed a Welch ANOVA and potentially Games-Howell post Hoc tests if we found statistical differences.

<table>
<thead>
<tr>
<th>&quot;Sig.&quot; values found with Levene's tests</th>
<th>Dependent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Risk Tolerance 0.62</td>
</tr>
<tr>
<td></td>
<td>Overconfidence 0.010</td>
</tr>
<tr>
<td></td>
<td>Cognitive Dissonance0.670</td>
</tr>
<tr>
<td></td>
<td>Regret 0.541</td>
</tr>
<tr>
<td>Nationality</td>
<td>Risk Tolerance 0.905</td>
</tr>
<tr>
<td></td>
<td>Overconfidence 0.142</td>
</tr>
<tr>
<td></td>
<td>Cognitive Dissonance0.012</td>
</tr>
<tr>
<td></td>
<td>Regret 0.298</td>
</tr>
<tr>
<td>Religion</td>
<td>Risk Tolerance 0.149</td>
</tr>
<tr>
<td></td>
<td>Overconfidence 0.122</td>
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<tr>
<td></td>
<td>Cognitive Dissonance0.002</td>
</tr>
<tr>
<td></td>
<td>Regret 0.005</td>
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<tr>
<td>Field of Study</td>
<td>Risk Tolerance 0.000</td>
</tr>
<tr>
<td></td>
<td>Overconfidence 0.406</td>
</tr>
<tr>
<td></td>
<td>Cognitive Dissonance0.000</td>
</tr>
<tr>
<td></td>
<td>Regret 0.098</td>
</tr>
<tr>
<td>Risk Tolerance</td>
<td>Risk Tolerance 0.983</td>
</tr>
<tr>
<td></td>
<td>Overconfidence 0.057</td>
</tr>
<tr>
<td></td>
<td>Cognitive Dissonance0.012</td>
</tr>
</tbody>
</table>

Table 3: “Sig.” values found using Levene’s tests

4.5 Quality Criteria

Reliability, replicability and validity are three quality criteria that must be respected in order to have a valid paper. A study is reliable if its measures are consistent (it means that the measure must be stable over time). Thus, if we use the same measures with other students there should be minor variations of results. The analysis made with t-tests and ANOVA are based on 95% confidence intervals. Thus, our results should be the same in the future except if there is an evolution of thought from one generation to another. Internal reliability of the scales has been evaluated with Cronbach’s Alpha (part 4.2), which enables to assess the “reliability of participants' responses to the measurements” (Helms et al, 2006, p. 633). Cronbach’s Alpha determines if the indicators that form the scale are consistent or not (Bryman & Bell, 2011, p. 159). Our different Cronbach’s alphas - higher than 0.6 (Shelby, 2010, p. 143) - show that we have a good level of internal validity.

A study should also be replicable, it means that if another researcher wants to use the findings of a previous research to develop his own, he should be able to do that with ours. As advised by Bryman & Bell, (2011, p. 41), we tried to explain thoroughly every step of our research procedure. In this way, if other scholars want to use our findings to develop their own research, they will not encounter any problem. For this study we collected primary data in order to compare previous findings with our sample of respondents. If other researchers want to analyse the same variables with the same sample, or try another sample as we did, they will be able to base their study on our research.
Validity of a research can be assessed by analysing the integrity of its conclusion. Bryman & Bell (2011, p. 42) consider it as the most important quality criterion in a research. The validity of a research can be appreciated with four different measurements. First, the measurements of a concept should reflect this concept. Do our measures reflect what they are supposed to reflect? Our data were processed with Microsoft Excel and SPSS for the ANOVA tests and the t-tests. These tests help us to investigate the correlation between our independent variables (gender, nationality, religion, field of study) and our independent variables (risk tolerance, overconfidence, cognitive dissonance and regret). Secondly, there must be a causality of the measurement and the relationship between variables (Bryman & Bell, 2011, p. 42). Since this study will determine the relationship between our independent variables and dependent variables of our participants. We already know from past studies that these demographics should play a role in influencing the level of the concepts. Besides testing these influences, we will also conduct an analysis in order to see if the level of risk tolerance and the level of the investment behaviour biases are connected. We will report only statistically significant influences. Therefore, the internal validity is obtained. Thirdly, our findings should be generalizable to other studies. To conduct this research we used previous theories in order to compare them with our findings. As our results are from primary data and are accurate, future researchers on the subject could use them alongside for their own purposes. This research is studying a particular sample but the demographics analysed are used in lot of researches. Therefore, as we did, the findings can be used to do a research based on different samples. Finally, we have developed specific parts to explain the limitations we encountered and some suggestions to avoid them. We also add information about ideas that could be followed in order to conduct future researches on the same subject.

4.6 Ethical considerations

While conducting a research and processing data from respondents, there are some core rules to follow. An important consideration of ethics in business research is to create a respectful and trustful environment with the participants (Saunders et al., 2012, p.231). The respondents should not be pressured to respond the survey (Saunders et al., 2012, p.237). It is very important to make them comfortable in order to obtain their answers. For this purpose, we have to explain in what they are going to be part of, following the ‘information principle’ e.g., why we need their help for our study (Patel & Davidson, 2011, p. 63) and respect their choices if they don’t want to be part of it. To respect these principles, we clearly exposed in our emails and in the introduction of our questionnaire, the purpose of this thesis (investigate student’s risk tolerance and investment behavior). We can note that we didn’t pressure our participants because we first ask teachers and deans from different Business Schools if they could forward our emails to their students. If their answer was positive, we didn’t require their students to answer it. They were free to participate or not to our research.

It is also fundamental of being nice and not hurting the potential participants (Bryman and Bell, 2011, p. 128). This means that we have to get their approval in being part of the research and we have to care about minimizing the risk of hurting them. Moreover, it is important to be clear on the fact that the questionnaire is fully confidential and anonymous. According to Bryman and Bell, (2011, p. 129) in order to collect honest answers from the participant, the responses should be anonymous. We use Google Docs to create our online survey. Then, we sent an email with a link that redirects the participants on a webpage with the survey. All the answers were processed by Google Docs. During all the process, respondents were anonymous and we had no possibility to identify them.
5. Empirical findings and analysis

In this chapter, we will present the empirical findings that we got during our data collection process. We will summarize the distribution process of our survey, present the characteristics of our respondents, check the reliability of our answers with the Cronbach’s Alpha and finally discuss our findings. The survey was sent for the first time on the 8th of May and we closed it on the 14th of May. We have contacted the deans of Stockholm School of Economics, Gothenburg School of Business, Economics and Law, the IHM Business School and Miss Lions (Business, Administration and Finance teacher) and Mister Frost (Director of studies, Business, Administration and Marketing) at Umeå School of Business and Economics. In France, we have contacted Miss Berbara (Center for Personal and Professional Development) at ICN Business School and Mister Celse (Associate Professor in Organizational Behaviour) at the Burgundy School of Business. We had three positive answers from Misses Lions and Berbara and from Mister Celse. All of the other answers were negative. Given a high rate of participation in France, we didn’t contact more schools.

At the end of our data collection, we got a total of 367 answers, with 166 participants who currently invest in the stock markets and 161 who don’t. We will go into details in the following part.

5.1 Demographics

The first part of our survey was about the personal details of our respondents, including the demographics we were testing and some personal questions about their purposes behind their portfolios and the sources of their information about financial markets.

We filtered the respondents with the first questions, when we asked if they are currently studying in a Business School and if they are investing money directly in the stock market (if they answered no, the questionnaire ended). Thanks to these questions, we were able to target the respondent we wanted to reach. Nevertheless we can point out that we got only 20 answers from people who are investing indirectly in the market. The difference between the level of direct investment (90% of all our respondents) and indirect investment (10% of our respondents) is significative. We explained in details in the “other findings” part of this thesis, that lots of our respondents want to invest in order to get better understanding but also for long term wealth creation. Investing indirectly is a good method for wealth creation because in this case, market professionals invest the money of their clients. Thus, beginner mistakes are avoided and bigger returns could be expected on the long run. Nevertheless, investing directly, even if the returns could be lower, allow investors to make their own choices and research and develop strategies based on their findings. Consequently this last method of investing combine both self-learning and could lead to wealth creation. Which should fit better with the purposes of student investors.

The respondents of our survey are 65% male and 35% female. Which is not surprising because, on average, men participate more in the stock market than women (van Rooij et al. 2011).

Our second demographic is about nationality. As we distributed our survey only in French and Swedish Business Schools, almost all the respondents were French or Swedish. Nevertheless, we had more nationalities represented (such as Mexico, the Netherlands,
Germany and Morocco) but given that they were represented by very few respondents, we decided not to take them into account in order to keep our results accurate. With the method of distribution of our survey, we managed to reach more Business Schools in France than in Sweden, thus, our participants are 71% French and 29% Swedish. After having compared the total of respondents of each countries and the total of students investing, we found that 72.4% of our Swedish respondents were investing against 44.6% for French. According to Guiso, Haliassos and Jappelli (2002), in Sweden, half of the households invest in stock market and only one quarter in France (More details are provided in the our theoretical framework). Even if our research deals with students, we can see this difference. With these results it is possible to conclude that there is a significant difference in stockholding between countries.

The fourth question was about religion. For the same purpose as explained in the previous question, we decided to keep only the more representative ones. We removed Islam, Judaism and Orthodoxy, because less than 5 respondents were in each of these categories. Our participants are 34% Catholics, 17% Protestant and 49% unaffiliated. Which can be surprising because according to Iannaccone, (1998) and Guiso et al (2003), religiosity is linked to a higher level of saving. But they also said that Catholic appeared to value savings more than Protestant.

The last question about our demographics was the field of study. We reached 51% of students from Accounting / Finance, 17% from Economy / Strategy, 19% from Management and 13% from Marketing. Here again, no surprise, Accounting / Finance people are learning how to save their money in financial markets at school. According to Bayer, Bernheim & Scholz (1996), there is a correlation between stock market participation and financial education. Moreover, these results could be explained also, by the fact that only one Business, Administration and Finance teacher at the Umeå School of Business and Economics forwarded our questionnaire. Even, if the survey was sent to all of her students, we can imagine that more finance students received it.

5.2 Cronbach’s Alpha

When a questionnaire is conducted, the internal reliability of the answers must be checked. Each concept should be consistent with the questions of the questionnaire. To assess this consistency, a Cronbach’s Alpha is computed. In order to be consistent, the Alpha must be more than 0.7 (DeVellis, 2003; Kline, 2005). An alpha higher than 0.6 is also accepted (Shelby, 2010, p. 143). As we measure four different concepts (risk tolerance, overconfidence, cognitive dissonance and regret) we have four different alphas, which are represented in the table 4. According to these results, all our concepts are consistent with our questions and are reliable for analysis. Regarding overconfidence, we can note that is alpha is lower than 0.7. According to Dennick and Tavakol (2011, p. 54), a low value of alpha could results from a small number of questions. Here, overconfidence was related to only 3 questions.
5.3 Statistical analysis

5.3.1 Risk tolerance and its determinants

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Cronbach's alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk tolerance</td>
<td>0.776</td>
</tr>
<tr>
<td>Overconfidence</td>
<td>0.635</td>
</tr>
<tr>
<td>Cognitive dissonance</td>
<td>0.757</td>
</tr>
<tr>
<td>Regret</td>
<td>0.713</td>
</tr>
</tbody>
</table>

Table 4: Cronbach’s alpha

In order to investigate if gender is related to different levels of student’s risk tolerance. We use an independent-samples t-test. There are 108 male student participants and 58 female student participants. We display the different data as mean ± standard deviation. As shown in table 5, risk tolerance is lower for male students (7.47 ± 2.50) than for female students (7.79 ± 2.39). However, if we refer to the independent t-test (table 5), we note that this difference of 0.32 is not statistically significant because Sig (2-tailed) = 0.418 > 0.05 (95% confidence intervals). In other words, this study suggests that gender doesn’t affect risk tolerance when it come to students (we can’t reject the null hypothesis).

We use an independent-samples t-test so as to study the influence of nationality on student risk tolerance. There are 118 French student participants and 48 Swedish student participants. According to table 5, Swedish students (7.94 ± 2.33) have a higher level of risk tolerance than for French students (7.44 ± 2.46). Nevertheless, if we analyse the independent t-test (table 5), we see that this difference of 0.50 is not material because Sig (2-tailed) = 0.905 > 0.05 (95% confidence intervals). Therefore, this paper insinuates that nationality has no correlation with student’s risk tolerance (we can’t reject the null hypothesis).
A one-way ANOVA is conducted to investigate if religion has a correlation with different levels of student’s risk tolerance. Our respondents are either unaffiliated (n = 82) or catholic (n = 56) or protestant (n = 28). According to table 5, risk tolerance level increases from “Catholic” (7.27 ± 2.41), to “Unaffiliated” (7.71 ± 2.49), to “Protestant” (7.82 ± 2.26). We observe (table 5) that the differences are not statistically significant because Sig = 0.481 > 0.05, thus we don’t have to do a post-hoc test to understand the roots of these differences. Accordingly, religion doesn’t influence student’s risk tolerance (we can’t reject the null hypothesis).

We conduct a one-way Welch ANOVA in order to investigate if the level of risk tolerance is related to the fields of study. Our respondents are either studying accounting / finance (n = 84) or marketing / communication (n = 22) or management (n = 28) or economy / strategy / statistics (n = 32). Risk tolerance (table 5) increases from the economy, strategy and statistics group (6.28 ± 1.14) to the marketing and communication group (7.41 ± 1.89), to the accounting and finance group (7.96 ± 2.72) to the management group (8.07± 2.48). According to table 5, “Sig” = 0.000 < 0.05, therefore the level of risk tolerance is statistically different between students with different fields of study (95% confidence intervals). In order to understand where the differences come from, we have to analyse the “Games-Howell post hoc test” (Appendix B), which displays that, the increase of 1.68 from the economy, strategy and statistics group to the economy and finance group is significantly different. Also, the increase of 1.79 from the economy, strategy and statistics group to the management group is material. With a 95% confidence level, we can highlight that students in marketing and communication have the lowest level of risk tolerance. Students in economy, strategy or statistics have the second lowest level of risk tolerance, those in accounting and finance the third lowest level. Finally, students in management are the more prone to risk tolerance. Therefore we accept the alternative hypothesis: field of study seems to be related to different levels of student’s risk tolerance.

In conclusion, field of study is the only one demographic related to different levels of student’s risk tolerance.

5.3.2 Overconfidence and its determinants

<table>
<thead>
<tr>
<th>Gender</th>
<th>Nationality</th>
<th>Religion</th>
<th>Field of study</th>
<th>95% confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>France</td>
<td>Sweden</td>
</tr>
<tr>
<td>Mean</td>
<td>6.27</td>
<td>6.19</td>
<td>6.36</td>
<td>5.96</td>
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<tr>
<td>Std. Dev</td>
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<td>1.21</td>
<td>1.46</td>
<td>1.20</td>
</tr>
<tr>
<td>Number of participants (n)</td>
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<td>58</td>
<td>118</td>
<td>48</td>
</tr>
<tr>
<td>Sig. 2-tailed (t-test or Welch t-test)</td>
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<td>0.142</td>
<td>0.742</td>
<td>0.184</td>
</tr>
</tbody>
</table>

Table 6: statistics related to overconfidence
We display the different data as mean ± standard deviation. As shown in table 6, male students (6.27 ± 2.50) have a higher level of overconfidence than for female students (6.19 ± 1.21). If we refer to the independent Welch t-test (table 6), we note that this difference of 0.08 (95% confidence intervals) is not materially significant because Sig (2-tailed) = 0.73 > 0.05. To put it simply, this study suggests that gender has no relationship with different level of student’s overconfidence (we can’t reject the null hypothesis).

Table 6 highlights that, overconfidence is higher for French students (6.36 ± 1.46) than for Swedish students (5.96 ± 1.20). According to the independent t-test (table 6), we notice that this difference of 0.40 is not materially significant because Sig (2-tailed) = 0.142 > 0.05. Therefore, according to this investigation, nationality is not related to different levels of student’s overconfidence (we can’t reject the null hypothesis).

Student’s overconfidence (Table 6) increases from “Unaffiliated” (6.17 ± 1.44), to “Protestant” (6.21 ± 1.13), to “Catholic” (6.35 ± 1.47). Nevertheless, these differences are not statistically significant because the Sig value given by the ANOVA test equals 0.742 (it is higher than 0.05), therefore we don’t have to do a post-hoc test. Accordingly, religion doesn’t influence overconfidence when it comes to students (we can’t reject the null hypothesis).

Overconfidence level increases from the marketing and communication group (5.72 ± 1.45), to the economy, strategy and statistics group (6.06 ± 1.11), to the management group (6.35 ± 1.37), to the accounting and finance group (6.41 ± 1.38). The ANOVA test informs us that the differences are not significant because Sig = 0.184 > 0.05 (it means that we don’t have to do a post-hoc test. In other words, this study suggests that field of education has no relationship with student overconfidence (we can’t reject the null hypothesis).

All in all, no demographics are related to different levels of student’s overconfidence.

### 5.3.3 Cognitive dissonance and its determinants

<table>
<thead>
<tr>
<th>Gender</th>
<th>Nationality</th>
<th>Religion</th>
<th>Field of study</th>
<th>Cognitive dissonance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Female</td>
<td>France</td>
<td>Sweden</td>
<td>Unaffiliated</td>
</tr>
<tr>
<td>Mean</td>
<td>3.36</td>
<td>3.40</td>
<td>3.31</td>
<td>3.52</td>
</tr>
<tr>
<td>Std. Dev</td>
<td>0.83</td>
<td>0.86</td>
<td>0.86</td>
<td>0.74</td>
</tr>
<tr>
<td>Number of participants (n)</td>
<td>108</td>
<td>58</td>
<td>118</td>
<td>48</td>
</tr>
<tr>
<td>Sig. 2-tailed (t-test or Welch t-test)</td>
<td>0.795</td>
<td>0.124</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. 2-tailed (Anova or Welch Anova)</td>
<td></td>
<td></td>
<td>0.025</td>
<td></td>
</tr>
</tbody>
</table>

**Table 7: statistics related to cognitive dissonance**

We display the different data as mean ± standard deviation. Cognitive dissonance is higher for female students (3.40 ± 0.86) than for male students (3.36 ± 0.83). Nevertheless, if we refer to the independent t-test (table 7), we note that this difference of 0.04 is not materially
significant because Sig (2-tailed) = 0.795 > 0.05. Apparently, gender has no correlation with cognitive dissonance when it comes to students (we can’t reject the null hypothesis).

Swedish students have a higher level of cognitive dissonance (3.52 ± 0.74) than French students (3.31 ± 0.86) according to table 7. The Welch t-test related to these variables (table 7) proves that this difference of 0.21 (95% confidence intervals) is not material because Sig (2-tailed) = 0.124 > 0.05. Furthermore, this study suggests that nationality doesn’t influence cognitive dissonance (we can’t reject the null hypothesis).

Student cognitive dissonance level (table 7) increases from the catholic group (3.11 ± 0.93) to the protestant group (3.50 ± 0.75) to the unaffiliated group (3.51 ± 0.76). According to the Welch ANOVA test, “Sig” = 0.025 < 0.05, therefore the level of cognitive dissonance is statistically different between students with different religions. In order to analyse where the differences come from, we have to explore the “Games-Howell post hoc test” (Appendix C). This test displays that the increase of 0.40 from the Catholic group to the unaffiliated group is material. With a 95% confidence level, it appears from this investigation that Catholic students have a lower level of cognitive dissonance than unaffiliated students. Therefore we accept the alternative hypothesis: religion has a correlation with different level of student’s cognitive dissonance.

Students in marketing and communication have the lowest level of cognitive dissonance (2.77 ± 0.81). Then, students in economy or strategy or statistics have second level of cognitive dissonance (2.84 ± 0.85). Students in accounting and finance rank third (3.55 ± 0.77) and those in management rank fourth (3.93 ± 0.26). According to ANOVA Welch’s test, “Sig” = 0.000 < 0.05, therefore the level of cognitive dissonance is statistically different between students with different fields of study. In order to explore where the differences come from, we have to analyse the “Games-Howell post hoc test” (Appendix D). This test displays that the increase of 0.77 from the marketing and communication group to the economy and finance group is materially different. Also, the increase of 0.38 from the accounting and finance group to the management group is significantly different. Similarly, the increase of 0.70 from the economy, strategy and statistics group to the accounting and finance group is statistically important. Also, the increase from (i) the marketing and communication group and (ii) the economy, strategy and statistics group to the management group are significantly different. Thus, we can reject the null hypothesis and accept the alternative hypothesis: field of study seems to have a relationship with the level of student’s cognitive dissonance (with a 95% confidence level).

Finally, religion and field of study have a correlation with different levels of student’s cognitive dissonance.
5.3.4 Regret and its determinants

We display the different data as mean ± standard deviation. As shown in Table 8, regret is lower for female students (4.97 ± 1.30) than for male students (5.12 ± 1.36). If we observe the independent t-test (table 8), we note that this difference of -0.15 is not statistically significant because Sig (2-tailed) = 0.478 > 0.05. It appears that gender should not have a correlation with different levels of student’s regret (we can’t reject the null hypothesis).

Table 8 displays that regret is higher for French students (5.21 ± 1.36) than for Swedish students (4.71 ± 1.20). If we refer to the independent t-test, we see that this difference of 0.50 (95% confidence intervals) is statistically significant because Sig (2-tailed) = 0.027 < 0.05. This analysis suggests that nationality affects regret (we reject the null hypothesis). Accordingly French students seem to have a higher level of regret than Swedish student.

Regret level (table 8) increases from the protestant group (4.57 ± 0.69) to the unaffiliated group (5.07 ± 1.43), to the catholic group (5.30 ± 1.39). According to Welch ANOVA (table 8), “Sig” = 0.003 < 0.05, therefore the level of regret is statistically significantly different between students with different religions. In order to investigate where the differences come from, we have to analyse the “Games-Howell post hoc test” (Appendix E). This test proves that the increase of 0.50 from the protestant group to the unaffiliated group is significantly different. Also, the increase of 0.19 from the protestant group to the catholic group is significant. Thus, this study suggests that religion affects regret (we reject the null hypothesis). Protestant students are the less prone to regret, followed by unaffiliated students (second highest level of regret) and lastly by Protestant students (highest level of regret).

According to table 8, regret level increases from the management group (4.36 ± 1.34), to the economy, strategy and statistics group (4.94 ± 1.01), to the accounting and finance group (5.19 ± 1.35), to the marketing and communication group (5.68 ± 1.36). We note (figure 11) that the differences are significant because Sig = 0.003 < 0.05, thus we have to do a tukey post-hoc test (Appendix F) to understand the roots of these differences. According to this test, the differences stem from the increase of 0.83 from the management group to the accounting and finance group. Similarly, the increase of 1.32 from the management group to the marketing and communication group is statistically significant. In other words, this study suggests that field of study has a relationship with regret (we can reject the null hypothesis).

### Table 8: statistics related to regret

<table>
<thead>
<tr>
<th>Regret</th>
<th>Gender</th>
<th>Nationality</th>
<th>Religion</th>
<th>Field of study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>France</td>
<td>Sweden</td>
</tr>
<tr>
<td>Mean</td>
<td>5.12</td>
<td>4.97</td>
<td>5.21</td>
<td>4.71</td>
</tr>
<tr>
<td>Std. Dev</td>
<td>1.36</td>
<td>1.30</td>
<td>1.36</td>
<td>1.20</td>
</tr>
<tr>
<td>Number of participants (n)</td>
<td>108</td>
<td>58</td>
<td>118</td>
<td>48</td>
</tr>
<tr>
<td>Sig. 2-tailed (t-test or Welch t-test)</td>
<td>0.478</td>
<td>0.027</td>
<td>0.003</td>
<td>0.003</td>
</tr>
</tbody>
</table>

We display the different data as mean ± standard deviation. As shown in table 8, regret is lower for female students (4.97 ± 1.30) than for male students (5.12 ± 1.36). If we observe the independent t-test (table 8), we note that this difference of -0.15 is not statistically significant because Sig (2-tailed) = 0.478 > 0.05. It appears that gender should not have a correlation with different levels of student’s regret (we can’t reject the null hypothesis).
To summarize, nationality, religion and field of study have a relationship with different levels of student’s cognitive dissonance.

5.3.5 Is there a relationship between risk tolerance and investment behaviour of students?

The ranking scheme of our questionnaire allows us to draw a risk tolerance profile of the respondents. They can potentially have between three points and thirteen points. Based on Grable (1999), we allocated an averse-profile to the respondent if he ranks between three points and six points. Similarly, if he ranks between seven and nine points we give him a balanced risk profile and if the respondent has between ten and thirteen points we consider him as risk tolerant. Thus, we can conduct a one-way ANOVA in order to investigate if the risk tolerance profile has a correlation with different levels of overconfidence (ranked from three to 10).

A one-way ANOVA is conducted to investigate if there is a correlation between risk tolerance and overconfidence. Our respondents have either a risk-averse profile (n = 55) or a balanced risk profile (n = 69) or a risk tolerant profile (n = 42). We display the different data as mean ± standard deviation. According to table 9, overconfidence levels increase from the balanced risk profile group (5.97 ± 1.36), to the risk-averse group (6.09 ± 1.01), to the risk tolerant group (6.88 ± 1.52). We note (table 9) that the differences is significant because Sig = 0.002 < 0.05. In order to analyse where these differences come from, we have to analyse the tukey post hoc test (Appendix G). This test displays that the increase of 0.79 from risk-averse students to risk tolerant students is materially different. Also, the increase of 0.91 from student with a balanced risk profile to student risk with a risk tolerant profile is significantly different. Thus, we can reject the null hypothesis and accept the alternative hypothesis: risk tolerance seems to have a relationship with the level of student’s overconfidence. Risk tolerant students appear to have the highest level of overconfidence (with a 95% confidence level). Risk-averse students have the second highest level of overconfidence, and students with a balanced profile the lowest level.

Table 9: statistics related to risk tolerance and our investment biases

<table>
<thead>
<tr>
<th>Risk Tolerance</th>
<th>95% confidence level</th>
<th>Dependent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Overconfidence</td>
</tr>
<tr>
<td>Risk averse (n = 55)</td>
<td>Mean</td>
<td>6.09</td>
</tr>
<tr>
<td></td>
<td>Std. Dev</td>
<td>1.21</td>
</tr>
<tr>
<td>Balanced risk profile (n = 69)</td>
<td>Mean</td>
<td>5.97</td>
</tr>
<tr>
<td></td>
<td>Std. Dev</td>
<td>1.36</td>
</tr>
<tr>
<td>Risk tolerant (n = 42)</td>
<td>Mean</td>
<td>6.88</td>
</tr>
<tr>
<td></td>
<td>Std. Dev</td>
<td>1.52</td>
</tr>
<tr>
<td>Risk averse + balanced risk profile + risk tolerant</td>
<td>Sig. (Anova or Welch Anova)</td>
<td>0.002</td>
</tr>
</tbody>
</table>
We conduct a one-way ANOVA in order to investigate if there is a relationship between risk tolerance and cognitive dissonance of students. This investment bias (table 9) increases from the risk-averse group (3.11 ± 0.90) to the balanced group (3.46 ± 0.78), to the risk tolerant group (3.57 ± 0.77). According to table 9, “Sig” = 0.012 < 0.05, therefore the level of risk cognitive dissonance is statistically different between students with different risk profiles (95% confidence intervals). The tukey post hoc test (Appendix H) highlights that the increase of 0.46 from the risk-averse group to the risk tolerant group is significantly different. Similarly, the increase of 0.35 from the risk-averse group to balanced risk profile group is material. With a 95% confidence level, we can highlight that risk tolerant students have also the highest level of cognitive dissonance. They are followed by students with a balanced risk profile (they rank second) and by risk-averse students (they rank third). Therefore we accept the alternative hypothesis: risk tolerance seems to be related to different levels of student’s cognitive dissonance.

Our last investigation allows us to see if there is a relationship between risk tolerance and different levels of student’s regret. According to table 9, student’s regret increases from “Balanced risk profile” (4.88 ± 1.29), to “Risk tolerant” (4.95 ± 1.64), to “Risk averse” (5.68 ± 1.07). Nevertheless, these differences are not statistically significant because the Sig value given by the Welch ANOVA test equals 0.056 (it is higher than 0.05), therefore we don’t have to do a post-hoc test to understand the roots of these differences. Accordingly, different levels of student’s regret don’t influence risk tolerance (we can’t reject the null hypothesis).

All in all, overconfidence and cognitive dissonance influence student’s risk tolerance.

5.4 Other findings

In our questionnaire, we asked three questions (questions 8, 9 and 10) to be aware of the purposes behind investments of our respondents, to investigate the sources of their investment advice/information and to understand their financial knowledge. For these questions, we let the students the opportunity to give more than one answer.

The purposes behind their financial investments were asked first (question 8). It appears that 26.5 % of the respondents invest to cover future short-term expenses and 62% with the idea to create long-term wealth. These results are interesting because it shows that students think more on the long run and are already concerned about their future. Before this investigation, we thought that this consideration was more in mind of older people (those with a family and a job). Therefore, this study can be helpful for financial advisors (banks or private financial advisors) because it seems that long-term financial products like obligations or life insurances (as a long-term savings instrument) seem to fit to students. We also wanted to know if having a portfolio was a way for students to one-up the other - especially for those in accounting and finance. Approximately 11% of our respondents invest in order to have a differentiation on their curriculum. This number rises to 19% for the specific group of students in accounting and finance. This is understandable because there is nowadays a strong competition among newly graduated people in finance. After having spoke with various financial professionals and recruiters, we found that investing your own money while you are still studying, even if it is a small amount, could make a real difference for future job applications. In fact, lot of bankers and recruiters are not just interested by the diplomas and the professional experiences of their applicants, they are also focus on extracurricular activities. Thus, it could be a smart move to have a portfolio for this matter.
Next, we asked the sources of information (question 9) in order to know where students find their information/advice before investing. We were very surprised to see that 57% of them are using financial statements, as this kind of analysis requires a minimum of financial knowledge. Almost two-third of our respondents (64%) find information in newspapers. Due to this high percentage, we think that we should have been more precise in this question because we wanted to know if they are using real newspapers (and not online newspaper). 51% are using Internet, which is a pretty small amount given that Internet provides a wide range of information and that students are very familiar with it. Here again, we should have been more precise by dividing Internet in several categories (forums, online newspapers, article, reports). We also noticed that lots of our respondents use professional information (32% read brokers’ notes). Finally, 31% invest in the wake of market rumors. This result is very interesting because more than 80% of them have a risk tolerant profile (according to our rating scale questionnaire).

The investment knowledge level of the respondents was finally asked (question 10). It appears that 32% of our respondents have a limited knowledge, 43% a moderated knowledge, 21% a good knowledge and 4% are already experienced. Thus, 75% of the respondents are not very familiar with the financial markets. This is in harmony with the results of question 8 (about investment purposes) because 57% of the respondents invest in order to improve their knowledge of the financial markets. These results suggest that having a portfolio is a good way to be familiar with investment.
6. Discussion

The first goal of our thesis is to participate to research in analyzing the correlation between common demographics (gender, nationality, religion), a rarely investigated demographic (field of study) and different levels of students’ risk tolerance. At this end we will be able to analyse if students react as the whole population. The second aim is to contribute to research by analyzing the relationship between these demographics and different levels of student’s investment biases (overconfidence, cognitive dissonance and regret). This last field is a growing field of study with few works previously held on our topic. At our knowledge, only gender is tested with overconfidence. Lastly, we wanted to study the relationship between risk tolerance and these investment biases.

We start our discussion with the revision of our first hypothesis. Are demographics such as gender, nationality, religion and field of study related to different levels of student’s risk tolerance?

After having analysed our data, our empirical findings showed no significant difference between gender and risk tolerance when it comes to students. Comparing to previous studies, it is generally accepted that gender is a factor of risk tolerance (Bajtelsmit & Bernasek, 1996, p. 1, Powell and Ansic, 1997, p. 605). But according to Hanna, Gutter, and Fan (1998, p. 10 -11) and Grable and Joo (1999, p. 54), gender is not a relevant factor, which explains the difference in risk tolerance of an individual. Following our results, we will side with the researchers who found that this demographic doesn’t play a role in risk tolerance (even if they analyse the whole population and not just students). Therefore, we are rejecting our hypothesis when it comes to the influence of gender on student’s risk tolerance. Then, nationality is one factor that is hypothesized to impact risk tolerance (Cummings et al. 1971). However, our analysis showed no material difference between Swedish and French students. We can conclude, as Bartke and Schwarze (2008) concluded before, that nationality is not relevant to explain risk tolerance differences between countries. However, in our case, the findings only encompass students. Our hypothesis is rejected with nationality. We think that it could be very interesting for future researchers to analyse this relationship between countries more different (Sweden and Japan for instance). Next, it is frequently argued that the level of education of an individual could affect his risk tolerance (Haliassos and Bertaut, 1995, p. 1110; Sung & Hanna, 1996, 11). With our study, we wanted to contribute to this specific aspect by going deeper in the analysis and comparing people from the same level of education, but with different field of studies. Our results showed that the field of study was influencing the risk tolerance of an individual. In the specific case of Business Schools, we found that students in management are the more risk tolerant and that students in economy, strategy or statistics are the more risk averse. With these results, we can think that management students have less financial literacy than finance students, thus, investing in risky assets could arise from a lack of knowledge of financial market risks. In their studies, they are also learning how to deal with risky situations (how to manage a company in distress situation for example), which could explain their high degree of risk tolerance (contrary to students in marketing and communication). On the other side, economy, strategy or statistics students are at the bottom of the risk tolerance ranking. It could be explained because this field of study has a direct link with macro economy. Indeed, economy students, for instance, study the roots of the biggest financial crisis, which are often linked to investment biases (1929, 2000, 2007). For statistics students, they usually learn risk management during their studies. We can assume that given they are aware of the risky nature of the markets, they are prone to be risk averse. We can confirm our hypothesis, and we can say that field of study
might influence student’s risk tolerance. In addition we confirm also the findings of Cole and Shastry (2009, p. 2) that show that people with an educational background in finance would not be more risk tolerant than people with an education in another field of study. Finally, we didn’t find the same results as Bartke and Schwarze (2008) with respect to religion and risk tolerance (but in our case, we only focused on students). With our empirical findings we found that religion doesn’t affect student’s risk tolerance and that there are no significant differences in-between religions. It could be explained by the decrease of religion influence on individuals, generation after generation. We can reject our hypothesis about the influence of religion on student’s risk tolerance. Our empirical findings show that students don’t react as adults regarding risk tolerance (if we stick on the conclusions that have been the most commonly argued by previous researchers). It is probably a consequence of both the theory of emerging adulthood and the evolution of generational thinking.

We will now review the second hypothesis: Are demographics such as gender, nationality, religion and field of study related to different levels of student’s overconfidence? We display the different data as mean ± standard deviation. Bengtsson, Persson and Willenhag (2004, p. 1) find that male students are more confident than female students when it comes to expecting a good grade to a coming exam. From an investment behavioural point of view, Barber and Odean (2000, p. 261) find that women are less confident than men concerning their investment skills. Our results show no statistically difference between the overconfidence of female students (6.19 ± 1.21) and male students (6.27 ± 2.50). Thus, the hypothesis that gender influences the overconfidence of a student investor is rejected. For the relationship between overconfidence and nationality, despite a higher score for French students (6.36 ± 1.46) compare to the score of Swedish students (5.96 ± 1.20), the analysis found no materially differences between these two groups. As we didn’t have previous hypotheses to base our results on, we will say that nationality doesn’t influence significantly the overconfidence of a student investing in stocks. Our findings showed minor overconfidence differences between religious students (Catholic and Protestant) and unaffiliated students (we rejected our hypotheses about the possible influence of the religious affiliation). Lastly, we also discovered that field of study don’t have any correlation with different levels of student’s overconfidence. Given that we didn’t find any correlation with our demographics, we can think that overconfidence could be more influenced by external and temporary factors (Nolte, 2006) or by the student’s inherent belief in his or her ability to succeed (Lester et al, 1989, p. 75). Thus, this investment bias seems not to belong to any specific group.

With respect to our third hypothesis (are demographics such as gender, nationality, religion and field of study related to different levels of student’s cognitive dissonance?), we didn’t find any research dealing with the influence of these demographics on cognitive dissonance in the specific field of finance. At this end, we will base our findings on previous papers dealing with cognitive dissonance as a whole. Our empirical findings showed no statistically differences between female and male students regarding their cognitive dissonance. Therefore our hypothesis on the possible relationship between gender and different levels of student’s cognitive dissonance is rejected. The second demographic compared with cognitive dissonance is the nationality. Here again, no significant differences were found between French and Swedish students. We can reject our hypothesis on the relationship between nationality and the cognitive dissonance of a student investor. This result is consistent with Cooper’s work (2007) that claims that dissonance is experienced by individuals everywhere, it is not limited to a specific culture or country. However, different cultural values can lead to distinct cultural experiences. Indeed, American and European people are both motivated by
feelings of guilt and feeling of shame contrary to Asian people who are mostly motivated by feelings of shame. Given that cultural values in France and Sweden are very close we could have expected to find no difference between students. However, if we had selected two countries with different values, our results could have been different. According to our findings, the level of the cognitive dissonance of a student might be influenced by his field of study. Students in marketing and communication are the less prone to this bias, followed by economy, strategy and statistics students. Students in accounting and finance have the third highest level and students in management have the highest level. We confirm our hypothesis on the relationship between the field of study of a student investor and his level of cognitive dissonance. Our last demographic which is religion, might influence the level of cognitive dissonance of individuals on the market. In comparing our three variables, we saw that Catholic respondents were less cognitively dissonant than unaffiliated respondents and Protestant respondents. According to Barlett, Drew, Fahle & Watts, (1974), individuals with religious orientation and beliefs have a tendency to self-justify their beliefs when contradicted. This behaviour could favor cognitive dissonance. Our results showed a higher level of cognitive dissonance among Protestants, but according to this previous study, we would have expected to see the Unaffiliated with the lowest level. Therefore, we can confirm that the religion of a student investor might influence his level of cognitive dissonance. These results are interesting because cognitive dissonance is observed when an investor change his beliefs or investment styles to support his investments and students are individuals who are actually learning knowledge. Thus, a change in beliefs or investment strategies is understandable because, now, they are learning how to invest their money, they don’t have definite strategies. This characteristic is visible with our respondents given that 57% launched their portfolios to get a better understanding of the financial markets.

We will now investigate our fourth hypothesis (are demographics such as gender, nationality, religion and field of study related to different levels of student’s regret). According to scholars, regret depends on both the comparison with an outcome that may have occurred and feelings of responsibility (Sugden, 1985, p. 77 - 99; Fincham & Jaspers, 1980). Thus, this bias arises in specific situations (Kahneman & Tversky, 1982, p. 160 - 173). However, demographics such as gender, nationality, religion (but also marital status, income and number of children) don’t affect regret (Ritov and Baron, 1995, p. 119). Our collected data showed opposite results for students, with respect to the previously quoted demographics. Even if we determined that the regret level of students is not significantly influenced by his gender, we found that nationality, religion and field of study are correlated with different student’s level. Indeed, our empirical results showed a significant difference between the regret of French students (5.21 ± 1.36) and the regret of Swedish students (4.71 ± 1.20). We also found that the regret level of investors can be influenced by their religious affiliation. Our Protestant respondents had a score of regret of 4.57 (± 0.69), our unaffiliated respondents had a score of 5.07 (± 1.43) and our Catholic respondents had a score of 5.30 (± 1.39). Finally, management students are the ones with the lower level of regret, followed by the economy and strategy students, then the accounting and finance students and lastly the marketing and communication students. To explain these differences with previous research we can (i) think that students don’t react as the whole population with respect to gender (theory of emerging adulthood). We can also believe (ii) that our sample was not representative enough or (iii) that our confidence level of 95% was too broad (maybe we should have selected a confidence level of 99%). At this end, it could be interesting to see future results focus on this topic.
Our research on the investment behavioural biases of students comes up with some interesting findings. We found that the level of some of these biases can be correlated with our demographics. Given that these biases are present in every individual investor, it is important to be aware of them and to try to adapt our strategies in order to decrease their effects on our investments. Some researchers had pointed out that it is important to implement disciplined trading strategies and draw some guidelines to limit the effect of behavioural biases. One should think about the following before investing money:

Why would I purchase the stock?
What is my investment time horizon?
What is my objective expected return for this investment one year from now? Why should I do if the stock underperformed my objective?
How risky is this stock within my overall portfolio?

These are just guidelines but they can help an investor to focus on his first strategy. With our finding on cognitive dissonance, we can say that students are prone to change their strategies. Following these steps could help them to avoid some psychological trading mistakes. Investment behaviour should be carefully studied in the future. Our results showed differences among students. This research should thoroughly studied and extended to the whole population of investors. If they are more aware of these biases, markets may react more efficiently and investment losses could be decreased.

Our last goal was to analyse a possible relationship between the level of risk tolerance and different levels of student’s investment biases. Our empirical results showed some patterns. We found that the level of overconfidence and the level of risk tolerance of students are related. More precisely, the more the students are overconfident, the more they are risk tolerant. This result is in harmony with Pan and Statman’ outcomes (2010, p. 1 - 28). Nevertheless, we found that students with a balanced level of risk tolerance appear to be the less overconfident. We think that more research should be made on this particular field in order to check the accuracy of these results. We also found a relationship between the risk profile of students and their level of cognitive dissonance. A high level of risk tolerance seems to go hand in hand with a high level of cognitive dissonance. This result is not surprising because a risk tolerant student is often prone to change his investment habits. For instance, he is not reluctant to change his investment style (chart analysis, P/E ratio) to invest in promising sectors. Finally, we didn’t find any relationship between the risk profile and the level of regret of our students. Regrets are mainly related to sentiments felt once an investment has been made. The risk profile of investors has already influenced his investments. Therefore, our findings are understandable. All these results could be analysed more thoroughly by future scholars because they could be fruitful for professional investors. Right now portfolio managers and brokers are only evaluating the risk profile of their customers before investing their money. However, if behavioural biases play a role in influencing the risk tolerance of investors, they also should be assessed. This would allow to have a better understanding of investor’s psychology.
7. Conclusion

In this part we answer our research question, we explain our contributions, we expose the problems we encountered and we make some recommendations for researchers who will analyse this field of study in the future.

Through this paper, our first wish was to study student’s investment behaviour and risk tolerance. Research gap were found (i) when dealing with students, (ii) in the investment behavioural field and (iii) in the possible relationship between risk tolerance and investment behavior.

7.1 Answer to our research question

Our research question is:

“What are the determinants of risk tolerance and investment behaviour of students and is there a relationship between risk tolerance and investment behaviour?”

After the analysis of our empirical results, we found that when it comes to student investors neither nationality, nor gender, nor religion play a role in influencing their risk tolerance. Nevertheless, we found a significant relationship between the field of study and the level of risk tolerance. We concluded that the field of study might influence the risk tolerance of students (which is coherent because depending on their field of study, the financial knowledge of students will be altered). Despite a lack of consensus from previous researchers on the determinants influencing risk tolerance, we found that students don’t react as adults. The discrepancies found could be related to the theory of emerging adulthood or to an evolution of thought between generations.

For investment behaviour, though, we found more correlation with our determinants. We first analysed the overconfidence of our respondents and the possible relationships with our demographics. We didn’t find any correlation with this bias, which is not surprising because investor’s overconfidence may be (i) a temporary behaviour (Nolte, 2006) or (ii) linked to the individual’s belief to succeed. Thus, overconfidence seems not to belong to any specific group. We also investigated cognitive dissonance. Our empirical findings showed that this bias was correlated with religion and field of study. These results could be influenced by the fact that we focus on students from two countries with relatively close cultural values. Most of them are still learning how to invest and are more prone to change their investment strategies. Different levels of student’s regret seem to be influenced by nationality, religion and field of study. These findings appear to be in contradiction with previous research. It may be evidence that students don’t react as adults when it comes to investment behavior on the financial markets.

Finally, our last analysis suggests a possible relationship between risk tolerance and investment behavior of students. Our empirical results show that overconfident students have a high level of risk tolerance. Similarly, risk tolerant students own a high degree of cognitive dissonance. These intuitive results have been confirmed by our investigations.
7.2 Contribution

7.2.1 Research contribution

Investor’s risk tolerance is mostly investigated with adults. It is understandable given that investors on the financial markets are mainly workers or retired people. However, students represent an entire generation, and lots of them are already investing in the markets, included in stocks. Investigate their investment characteristics could help to better understand attitude of real actors on the financial markets. Most of papers we read dealing with this subject have a static approach to examine risk tolerance and investment biases: they are based on observations made at a particular moment of the life of different investors. In our case, we tried to have a dynamic approach through the analysis of students. Indeed, by comparing the features of student investors with those of adults (through our literature review) we wanted to know if risk tolerance and investment biases arise after years or if they are already present in the student years of an individual.

Our result showed differences between the demographics affecting student’s risk tolerance and those impacting adult’s risk tolerance. The same findings were observed with investment behavior. To explain these discrepancies, we already highlighted the theory of emerging adulthood and the evolution of thought from one generation to another. However, we do think that these differences also reflect that investment behaviors and risk tolerance shape over time. It may be a consequence of internal factors (intrinsic characteristics of each individual) external factors (wedding, the birth of a child), or the consequences of years of trading and experience gained. We believe that it could be very interesting for future papers to analyse thoroughly the elements that mould the evolution of risk tolerance and investment behavior over years.

Finally, we wanted to study the relationship between risk tolerance and investment behavior. At first sight, risk tolerance seems to affect investment behaviors. However these two aspects seem to be intertwined. When investors have a high level of risk tolerance they also have a strong level of overconfidence and cognitive dissonance. But we can also say – for example - that overconfident investors are highly risk tolerant and present cognitive dissonance. We endeavored through our discussion to highlight the interactions existing between these different concepts. This investigation is new and may lead to further research.

7.2.2 Practical contribution

Most of the portfolio managers and brokers are nowadays assessing the profile of their clients based on their risk profiles. However, we showed in this paper that the investment behaviour of individuals should be taken into account by professional in order to balance their assets in a better way. If the relationship between investment biases and risk tolerance is confirmed in the future, this paper may participate to enhance a better assessment of the profile of indirect investors. If risk profiles are influenced by behavioural biases, every professional should also evaluate the levels of overconfidence, cognitive dissonance, and regret of their clients.

Also, student investors are potential customers for asset managers, brokers, and investment funds. If professional investors fully understand how students behave and what they are looking for in the financial markets, it could be easier for them to meet students’ expectations and potentially invest for some of them. We found that 47% of our respondents invest for learning purposes. It means that 53% of students who respond to our survey invest regardless
of this consideration. At this end - without statistically generalizing this result – approximately half of students are present on the financial markets for other goals (future short term expenses or long term wealth creation) and only 10% of them, based on our sample, invest indirectly. Thus, this paper could help professional investors to improve their understanding of students’ need. Investing from now money for students with a minimum of assets could be an advantage to keep them as clients in the long run - when they will have a better professional situation and more money.

This paper could also benefit students who invest (or want to invest) in the financial markets. We shed light on the main investment biases present on the markets: overconfidence, cognitive dissonance and regret. To be aware of behavioral biases could help students to reduce them by implementing precise trading strategies. Even if students are present on the financial markets for learning goals, we believe that it is fundamental to have some insights of main mistakes that they could make.

7.3 Problem we faced

The first problem met during our research was the distribution of our questionnaire. We wanted, in order to be as accurate as possible, to reach students from different Business Schools by sending our survey to several deans and teachers. We hoped they could forward our survey to their students. Nevertheless, in Sweden, most of them didn’t reply to us or rejected our request (except in Umeå). In the end, we managed to collect data in Sweden only from students studying at Umeå School of Business and Economics. We had also more answers from French students. Indeed, our two French Business Schools accepted to release our survey (it explains why we have approximately two-third of French respondents). This had probably influenced our results and could explain the non-normal distribution of our independent groups during our empirical analysis.

In our questionnaire, we also found problems to analyse the answers related to the sources of information/advice. We should have detailed our possible answers more thoroughly. We detailed that some were interrelated (students can used online newspapers, brokers’ notes are usually found on Internet also) and it could have been misleading for our respondents. Finally, we might have collected not very accurate data for overconfidence. Our last analysis showed that high level of overconfidence was in relation with high level of risk tolerance. More surprisingly, we found that medium level of overconfidence was in relation with low level of risk.

Given that our three Cronbach’s Alphas linked to our questions about overconfidence, cognitive dissonance and regret were close to 0.7 (the Cronbach’s alpha of the questions related to overconfidence was lower than 0.7), we assumed that our questions related to behavioural biases (questions 14 – 20) were not common questions which could have been hard to understand for some of our respondents. We also could have added more questions but we were afraid to have a questionnaire with too many questions. Also, we supposed that some respondents who don’t invest answered our survey even if we clearly stipulated that we were only looking for answers from students investing in the stock markets. Thus we could have collected some data that were not totally accurate.

During the analytical part, we came up with other limitations tied to the choice of our determinants. One goal of our research was to analyse the impact of nationality on risk tolerance and investment behavior. At this end, we selected two European countries with
different level of stockholding. However, France and Sweden are not so far apart from each other. They are both European developed countries with similar cultural values. At this end, we could have expected to find no significant difference between French students and Swedish students. Perhaps we could have selected two countries with values, cultures, religions, education systems or average income more pronounced. We could have selected also more than two countries. Further research focusing on nationality should then compare countries with differences more significant if they are looking for discrepancies in their results. The same results appear with gender, we didn’t observe any particular influence of this demographic on our dependent variables. Instead, we could have selected another demographic never investigated (impact on the ranking of the Business School for example).

### 7.4 Recommendations for further research

Future researchers should try to avoid the limitations we encounter in our research. First of all, a better representative sample is needed. In our case, we expected to have groups of respondents (more than 10 participants) from at least five different Business School. It assumes to reach people differently that we did. They may, for instance, send directly their survey to relevant students from their target school (class delegates). They could also use their network more efficiently in order to reach more relevant respondents. Researchers should also pay attention to not collect data from people who are not investing in order to avoid any bias in their results. We think that asking the name of respondent's’ broker could be effective to reach people who are actually investing.

Also, future researchers could focus on new demographics when it comes to risk tolerance of investment behaviors. If they are dealing with students, they could investigate the influence of the ranking of the school in order to analyse if students from “top” business school are more risk tolerant / overconfident than people from schools more modest. Also, our independent variables are the main investment biases. However, it exists a very high number of other biases (confirmation bias, optimism bias, herding…). Having a specific focus on them could allow to participate to the development of behavioral finance.

The field of investment behavior is very important because the financial markets are present worldwide and we saw recently that they can strongly affect the world economy. To avoid irrationality, investors should be aware of how they can be influenced by specific events or by temporary emotions. Future researchers on this field could use a qualitative process in order to analyse these biases “on the ground”. Through the interview of well-targeted investors, they could understand precisely the nature of their behavioural biases. We also think that the investment behaviour of investors are impacted by specific events and temporary emotions. Therefore, conducting research on specific cases seems to be a good alternative procedure to obtain relevant findings. A good idea would be to test the influence of various specific scenarios on individuals and see how they react.
List of references


Hilson (2001). Extending the risk process to manage opportunities.


Shefrin, H., (2005), Behavioral Corporate Finance, McGrawHill.


Appendix A - Questionnaire

1. Where do you come from?
   a. France
   b. Sweden
   c. Other:

2. Are you currently studying in a French or Swedish Business School?
   a. Yes.
   b. No.

*if no, the questionnaire will be ended.*

3. Do you invest money in the stock market?
   a. Yes
   b. No
   c.

*if no, the questionnaire will be ended.*

4. Gender?
   a. Male
   b. Female

5. What is your religion?
   a. Unaffiliated
   b. Catholic
   c. Protestant
   d. Islam
   e. Judaism
   f. Other:

6. What is your main field of study?
   a. Accounting / Finance
   b. Marketing / Communication
   c. Management
   d. Economy / Strategy / Statistics
   e. Other:

7. How do you invest?
   a. Directly (By myself)
   b. Indirectly (a financial advisor invest my money)
If “Indirectly”, end of questionnaire

8. What is the purpose behind your investments?
   a. Self learning
   b. Long term wealth creation
   c. Future short term expenses
   d. Resume (CV) differentiation
   e. Other:

9. What is the source of your investment advice/information?
   a. Newspapers
   b. Market Rumors
   c. News Channels
   d. Family or Friends
   e. Internet
   f. Broker’s notes
   g. Certified Market Professional
   h. Financial statements
   i. Other:

10. What best describes your investment experience?
    a. Limited
    b. Moderate
    c. Knowledgeable
    d. Experienced

11. Over any one-year period, what is the maximum drop in percentage of your investment portfolio that you would be comfortable with?
    a. 0 - 5% decline
    b. 5 - 10% decline
    c. 10 - 15% decline
    d. 15 - 20% decline
    e. 20 - 25% decline

12. Which of the following portfolios would you be likely to invest in?
    a. Portfolio A - Earns an investment return of either 5% or a loss of 0%
    b. Portfolio B - Earns an investment return of either 15% or a loss of 5%
    c. Portfolio C - Earns an investment return of either 25% or a loss of 10%
    d. Portfolio D - Earns an investment return of either 40% or a loss of 15%
    e. Portfolio E - Earns an investment return of either 50% or a loss of 20%
13. When I invest my money, I am:
   a. Most concerned about my investment losing value
   b. Equally concerned about my investment losing or gaining value
   c. Most concerned about my investment gaining value

14. Suppose that you are related to a group of people who have a similar background and social status as you. Generally, when compared with them, you will most probably feel that you are?
   a. Better than average
   b. About the same
   c. Not as good as the average

15. When considering the next three months, do you have confidence in beating the market as a whole?
   a. Yes, very much
   b. Yes, I have some confidence
   c. No, I have no confidence at all

16. On average, how long do you hold your stocks in your portfolio?
   a. Daily
   b. Weekly
   c. Monthly
   d. Yearly

17. Do you feel comfortable to change your investment style (financial statement analysis, chart analysis) to invest in very promising sectors?
   a. Yes
   b. No

18. You previously bought a stock at 20€ with the objective to sell it at 30€. Today, the stock reach 30€ but all the consensus think it will keep increasing, what do you do?
   a. Follow my first objective, and sell at 30€
   b. Keep the stock

19. You missed a 20% return on a stock your friend strongly recommended you because you didn't invested in it, what do you think about it?
   a. I will have other opportunities
   b. It doesn’t matter
   c. I should have invested in it
   d. I will follow his recommendations in the future

20. Consider this scenario:
An individual stock investment you own just drop by 25%. What would you do?

a. Sell all of my shares  
b. Sell some of my shares  
c. Do nothing  
d. Buy more shares
Appendix B - Games-Howell post hoc (differences between risk tolerance and field of study)

<table>
<thead>
<tr>
<th>Games-Howell</th>
<th>Accounting/Finance</th>
<th>Marketing/Communication</th>
<th>Management</th>
<th>Economics/Strategy/Stats</th>
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* The mean difference is significant at the 0.05 level.

Appendix C - Games-Howell post hoc (differences between cognitive dissonance and religion)

<table>
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<tr>
<th>Multiple Comparisons</th>
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</thead>
<tbody>
<tr>
<td>Dependent Variable:</td>
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<td>Cognitive Dissonance</td>
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<tr>
<td>(A) Religion</td>
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<tr>
<td>(B) Religion</td>
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<td>Protestant</td>
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<td>Catholic Unaffiliated</td>
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<tr>
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* The mean difference is significant at the 0.05 level.
Appendix D - Games-Howell post hoc (differences between cognitive dissonance and field of study)

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* The mean difference is significant at the 0.05 level.

Appendix E: Games-Howell post hoc (differences between regret and religion)

### Multiple Comparisons

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<th>(I) Religion</th>
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<th>Mean Difference (I-J)</th>
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<th>Upper Bound</th>
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* The mean difference is significant at the 0.05 level.
Appendix F: Games-Howell post hoc (differences between regret and field of study)

### Multiple Comparisons

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<th>Dependent Variable: Regret</th>
<th>Independent Variables</th>
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Appendix G: Tukey post hoc test (differences between risk tolerance and overconfidence)

### Multiple Comparisons

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* The mean difference is significant at the 0.05 level.
Appendix H: Tukey post hoc test (differences between risk tolerance and cognitive dissonance)

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<td>Std. Error</td>
<td>Sig</td>
<td>95% Confidence Interval</td>
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<td>(J) RiskProfile</td>
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* The mean difference is significant at the 0.05 level.