



SCHOOL OF  
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## Cross-National Differences in Risk Preferences

*A quantitative study of demographic effects on risk appetite in strategic management amongst Dutch and Polish business students.*

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# **Abstract**

**Title:** Cross-National Difference in Risk Preference - A quantitative study of demographic effects on risk appetite in strategic management amongst Dutch and Polish business students.

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**Keywords:** risk preferences, organizational risk, risk management, strategic management, prospect theory, culture, nationality, demographics.

**Purpose:** This research aimed to investigate cross-national differences in risk preferences to uncover whether risk appetite, consisting of perceived and actual risk, differs amongst demographics. This paper aims to understand whether Polish and Dutch business students differ in their risk preferences and how this impacts strategic management.

**Methodology:** This research adopts a non-experimental quantitative correlation research design. The data examined is collected using a cross-sectional survey that is digitally distributed to the sample population. The survey consists of questions identifying risk appetite and demographic factors through the five-point Likert scale.

**Theoretical Perspectives:** This study is based on contradicting views from Damodaran (2007), Gándelman and Hernández-Murillo (2015), and Hofstede and Minkov (2010). These authors explained risk preference variations amongst nationalities. These theories are combined with Kahneman and Tversky's (1979) prospect theory.

**Empirical Foundation:** The target sample are Polish and Dutch business students, as they are prospective managers representing the so-called “leaders of tomorrow.” The empirical results are derived from 186 survey responses by Polish and Dutch business students of different ages, genders, and educational levels.

**Conclusion:** The conclusions highlight the importance of diversifying between actual and perceived risk preferences due to a significant difference between these two variables. Furthermore, it is concluded that the differences between countries exist, and demographics affect individuals' risk appetite, which impacts strategic management.

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# **1. Introduction**

The role of risk in organizations has recently seen a surge in importance and recognition, as risk-bearing decisions have brought companies more positive and negative impacts than ever before (Susanto and Bong, 2018). A recent event best showcases the repercussions that managerial risk-taking can have on individual organizations and, even at a larger scale, the global economy (Hoskisson et al., 2016). Erroneous managerial risk-taking at one of the largest investment banks in the world, Lehmann Brothers, resulted in its collapse and fueled one of the most significant global recessions, the effects of which we still feel today (Siepel and Nightingale, 2014). Consequently, to prevent such large-scale negative outcomes from happening in the future, the level of risk-taking across organizations will play a significant role. Managerial risk-taking is an essential part of strategic management as it increases competitive advantage and success (Hoskisson et al., 2016). According to formal economic principles of risk-taking, if the expected values for two strategies are identical but one is a greater gamble, managers would select the strategy with a more certain outcome (Hoskisson et al., 2016). Besides, Kahneman et al. (2020) found that managers are far more risk-averse than the expected risk-neutral average outcome, resulting in a lot of lost potential capital or innovation. However, all of the findings previously mentioned are rather general and not assigned to a particular demographic. There have been discrepancies between scholars over the past years on whether demographics influence the level of risk aversion. If they do, then the level of diversity in a company can affect its overall risk appetite level, which is vital for this study. Since companies employ people from various educational backgrounds, it is relevant for them to understand how the level of education affects risk appetite. Therefore, this paper aims to contribute to the current literature and explore how business students representing prospective managers from different countries are expected to react in situations with an unclear outcome and the factors that influence it.

## **Strategic Decision-making**

Risk represents an inherent characteristic of strategic decision-making, as every decision entails a level of uncertainty regarding the outcome (Pablo et al., 1996). We encounter hundreds of decisions every day that expose us to risk, some imposing more uncertainty than others. In a corporate setting, managers deal with the uncertainty that affects their organizations daily (Hoskisson et al., 2016). Their level of risk aversion influences these managers' decisions, a statistic often justified by demographic factors in existing literature (Wärneryd, 1996; Damodaran, 2007; Hofstede and Minkov, 2010). Anthropological theory suggests that people are mainly guided in their risk-avoiding and tolerating strategies by their backgrounds (Ward and Zurbruegg, 2000). Backgrounds include genetic and biological factors, but also the country and culture to which the individuals belong. The workforce of a company can be a very homo- or heterogeneous blend of demographics. Therefore, the amount of diversity in a workforce can potentially safeguard or harm the level of risk taken at a managerial level, highlighting the significance of research into the demographic factors driving risk aversion (Ward and Zurbruegg, 2000).

Various demographic factors affecting risk have been researched, most of all age and gender. In this paper, demographic factors such as age, gender, and education will be considered, focusing on ethnicity and culture as the main factor. "Ethnicity" entails a group of people sharing the same language, traditions, history, nation, and social treatment within their area of residence (Bös, 2015). Culture is diverse, can be formed by different nations and societies, and is based on historical events (Spencer-Oatey, 2012). Since ethnicity and culture are less tangible and harder to measure accurately, this paper will consider them under the generalized aspect of nationality.

## **Demographics**

Demographics are becoming more important in modern research, as they describe unique characteristics of a population - such as age, gender, or ethnicity. The growing popularity signals a shift away from the 'absolutism' stance, which posits that demographics have no influence on interests and behavior, towards a view of 'universalism,' which recognizes that demographics influence risk (Beins, 2009). This, however, is in stark contrast to the growing idea of globalization, where Held (2004, p.55) describes culture as: "a crucial component of globalization because it is through culture that common understandings are developed."

Disclosing demographic information in research is essential as it highlights whether the sample population is homogenous or heterogeneous (Creswell and Creswell, 2017). Different behavior driven by demographics can mean that research with a homogenous sample population can overlook relevant information. Therefore, according to Hammer (2011, p. 261): "researchers cannot assume that no differences exist between groups until this underlying hypothesis has been proven." The same stance should be adopted when discussing risk management in a corporate setting; until proven otherwise, we have to assume that demographics influence our level of risk aversion. Considering the Lehman Brothers scandal, it becomes clear that companies can have an interest in limiting their employee risk appetite in certain crucial departments.

## **Relevance**

Most research conducted until now is centered around economics, as risk-taking explains a significant part of our economic behavior. The aggregate of different behaviors fueling the wide range of economic decisions often provides a solid base for research (Rieger, Wang, and Hens, 2021). Substantial attention has been given to risk preferences across genders, with literature suggesting that women are more risk-averse than men (Eckel and Grossman, 2008; Croson and Gneezy, 2009; Bertrand, 2011; Niederle, 2014). The studies were partially contradictory because even though women are more risk-averse than men regarding decisions that do not carry heavyweight, they are as risk-averse as men when facing more substantial bets (Holt and Laury, 2002). Nevertheless, gender is not the only factor that has been found to moderate risk preferences. Several studies have shown that the older the population, the more risk-averse it is (Levin and Hart, 2003; Rakow and Rahim, 2010; Weller et al., 2015). Risk aversion reportedly increases simultaneously with age and economic risk (Paulsen et al., 2012). Individuals with higher attained education seek more risk than others as their level of risk tolerance increases when their level of education increases (Paulsen et al., 2012).

Studies conducted over the years have shown how many different factors can influence the propensity to risk, a feature that is of great importance when making decisions (Machina, 1987; Outreville, 2013). In addition to personal factors, the attitude towards risk-taking seems to be influenced by the culture (Hofstede and Minkov, 2010). Considering cultural differences, it is expected that societies differ in uncertainty avoidance, which represents one of the dimensions of culture. However, views on whether culture has a significant influence on an individual's

risk avoidance differ. Damodaran (2007) argues that no significant differences in risk aversion could be observed when referring to culture or race. Furthermore, the study conducted by Holt and Laury (2002) did not find any differences based on race that could impact risk avoidance. In contrast, Hofstede and Minkov (2010) concluded that demographic differences impact risk aversion. Hofstede's Uncertainty Avoidance Index (UAI) was developed in the 1960s and utilized data from 70 countries and represents one of the most renowned measures for estimating cultural behavior. Uncertainty avoidance refers to the level of tolerance that a country or culture possesses and how comfortable it is with ambiguous and unstructured events (O'Connell, 2013). Cultures that score high on the UAI are less comfortable with ambiguity and are more likely to follow the rules or regulations to control the level of uncertainty they will have to face. On the contrary, countries with lower UAI feel more comfortable facing uncertainty and are more tolerant of risk-taking and making change (O'Connell, 2013).

Based on the contradictory views, there is a significant gap in the research on nationality and its effect on risk-taking. The differences between scholars and their views on the topic in question might arise because their statements were generalized and deemed applicable outside the tested sample. Concluding that demographic factors such as age or gender affect risk appetite on a global level automatically excludes any intermediate effect caused by nationality. Therefore, to uncover what drives one's risk aversion, not only should multiple factors be considered, but also the results should be narrowed down and sample-specific. Therefore, this paper will solely focus on Polish and Dutch business students. The sample choice will be motivated in the following section. In addition, there are significant time gaps between the data collected for the existing literature. As the world is evolving, the behaviors of individuals might have changed over time as well.

## Purpose

This research paper aims to investigate whether risk preferences differ amongst demographics and how it affects strategic management. Therefore, the following research question will be examined:

*How do demographics impact risk appetite amongst Polish and Dutch business students in the context of strategic management?*

The paper focuses on risk aversion in two culturally different countries – The Republic of Poland (Poland) and The Netherlands. Both countries have a strong resemblance with Eastern and Western European cultures, which have proven to be very opposing. Hofstede and Minkov (2010) present a significant gap between the level of risk aversion in Poland and The Netherlands. Yet, Gándelman and Hernández-Murillo (2015) argue that the level of risk aversion is similar between these two countries. These conflicting views on a per-country basis increase the opacity on the topic caused by the previously mentioned contradictions by Damodaran (2007), Holt and Laury (2002), and Hofstede and Minkov (2010). In addition to opposing cultures, the relative ease of access to sample data is another reason why The Netherlands and Poland are compared.

The research focuses specifically on business students, aiming to provide an insight into how future leaders are expected to react in situations where the outcome is unclear. The aim is to provide insights that companies can use in the future rather than reflect on the past. On a practical level, this will help people who work in an international business better predict or understand their foreign colleagues' risk preferences and choices. This topic is timely in an age of economic globalization when communicating and understanding people from other countries is more essential than ever before. It is important to note that this study's results aim to highlight the significance of a diversified workforce, not to indicate which demographics companies should seek when recruiting to achieve their desired level of risk aversion.

This paper will contribute to the existing literature in risk aversion by investigating and thereby expanding and clarifying the contradictions on the demographical aspects of "nationality." In addition, the research will strengthen existing literature by considering demographic factors that have been more often related to risk aversion, namely age, gender, and education level.

This research adopts a non-experimental quantitative correlation research design (Creswell and Creswell, 2017). The data examined is collected using a cross-sectional survey that will be digitally distributed to the sample population. It will consist of questions identifying risk appetite and demographic factors through the five-point Likert scale. Once the optimal sample population, 170 according to the Cochran sample population formula, has been achieved, the data will be analyzed using statistical software and checked for validity/reliability to ensure the robustness of the results.

## **Outline**

The following section will present the theoretical framework, including an extensive description of previous research in risk and demographics. Hereafter, the methodology will provide insight into how this research was performed. The fourth section will present the results collected from the research, which will be further analyzed and discussed in the fifth section. Finally, the sixth section will conclude the research and provide recommendations for future studies on demographics in strategic risk management.

## **2. Literature Review**

As risk-taking decisions have resulted in increased positive and negative consequences for organizations, companies' focus on risk has risen in recent years (Susanto and Bong, 2018). If an organization does not change, innovate, and deal with risky situations, it will quickly fall behind its competition (Stone, 2005). Managers must take risky decisions, often in an unpredictable climate, to increase competitive advantage and lead the company towards success (Hoskisson et al., 2016). The following sections will address the topic of risk, more specifically its concept, factors that influence it, and its impact on strategic management. Moreover, ways to measure risk and explain how to understand an individual's choices when faced with risk will be described.

### **2.1.Risk**

The concept of risk has often been a source of confusion as there are numerous opinions amongst authors on the topic and its definition (Outreville, 1998). Historically, the Commission on Insurance Terminology of the American Risk and Insurance Association (1965, p. 4) defined risk as: "uncertainty as to the outcome of an event when two or more possibilities exist." A definition that was later redefined by Head (1967, p. 205) as: "the objective probability that the actual outcome of an event will differ significantly from the expected outcome because of the lack of measurability." According to the classical decision theory, the risk is defined as "the variance of the probability distribution of possible gains and losses associated with a particular alternative" (March and Shapira, 1987, p. 1404). Risk has long been associated with the idea of only unfavorable outcomes (Smith, 1776). Many authors see it as uncertainty regarding the occurrence of loss (Greene and Trieschman, 1988; Rejda, 1989). The International Organization of Standardization has adopted previously defined concepts, which are in line with Head (1976), and in 2009 described risk as the "effect of uncertainty of objectives which can deviate or have positive or negative implication on the expected outcome. It is often characterized by a particular event, change of circumstances, or consequence" (ISO Guide, 2009). The definition of risk in this paper is the one depicted by The International Organization of Standardization, where risk is associated with both – losses and gains. It is the effect of uncertainty in situations where the outcome is unclear.

While most current definitions of risk associate it with positive and negative outcomes, researchers find this does not hold for managers as they are found to perceive risk solely as a probability of loss (Camerer et al., 1988; Yates and Stone, 1992). Moreover, the fact that risk is seen as a mixture of both – danger and opportunity leads to a perception that opportunity arising in the business world always goes hand in hand with a threat (Andersen et al., 2014). The differences in defining risk have led to elaboration on its dual character, with one of the arguments being conceptualized in relation to a competition: when one entity loses, another may be gaining (Borghesi and Gaudenzi, 2013). The capability of risk to produce losses or gains was often explained in terms of making decisions that have monetary consequences. Such consequences can be either positive, negative, or uncertain. However, the concept also applies to cases where gains and losses are not readily observable, such as managing a business (Borghesi and Gaudenzi, 2013).

Risk aversion plays a significant role in decision-making since outcomes are often uncertain. Initially, risk aversion was defined as a preference for decreasing risk (Hong et al., 1987; Machina, 1987; Roell, 1987; Yaari, 1987). The inverse of risk aversion is risk tolerance; when risk tolerance increases, risk aversion decreases (Outreville, 2013). The established anthropological theory posits that individuals are guided in their risk-avoiding and tolerating strategies by their cultural background (Ward and Zurbruegg, 2000). These backgrounds differ per country, and that is what Gándelman and Hernández-Murillo (2015) investigated.

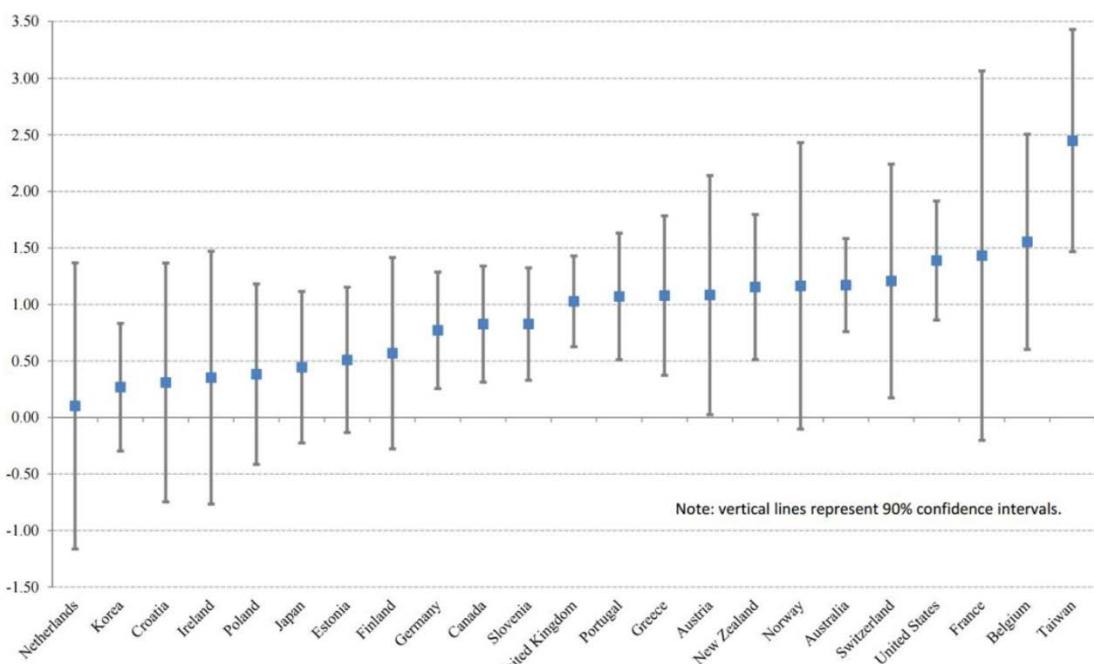


Figure 1: Relative Risk Aversion in Developed Countries

Their paper looked at the relative risk aversion in developed countries. The average coefficient of risk aversion is represented by the number 1, posing that most individuals have positive risk tolerance. The results of Gándelman and Hernández-Murillo (2015), visualized in Figure 1 above, represent not only significant differences between countries but also between neighboring countries and within a country, visualized by the vertical lines that show the standard deviation of countries. Where Norway and Australia, for example, have a nearly identical average level of risk aversion, the results of the Australian population are closer to the mean than the Norwegian sample, indicating significant differences within the population. Similar observations are made for the Dutch population; while their average level of risk aversion is the lowest in the sample, their broad standard deviation brings them more in range with other countries. Poland is slightly less risk-averse than The Netherlands but still places relatively low compared to the rest of the analyzed countries.

### **2.1.1. Perceived versus Actual risk**

When discussing risk aversion, it is essential to state what type of aversion. Risk aversion can be either perceived or actual. Despite the differences, it is not often evident in studies which type of risk preference is analyzed or whether the risk is analyzed as a whole. (Schoemaker, 2021). There are different hypotheses on why people perceive risk preferences differently from what they are.

An example is the risk-as-value-notion, where individuals perceive others as more willing to take risks than themselves as they consider being a risk-taker an admirable characteristic (Brown, 1965). Sitkin and Pablo (1995) argue the importance of the difference between the two types because of the implications on corporate management. Their study shows that the framing of problems and questions has a significant impact on risk perception, warning managers to be careful to frame an issue positively or negatively in relation to how they wish their subordinates to respond. Kahneman and Tversky (1979) differentiated risk-taking between intrinsic risk attitude (IRA) and observed risk-taking. IRA refers to people's basic preferences towards risk; in biological and personality theories, it refers to the behaviors ingrained at an early stage of life (Becker, 1990).

On the other hand, observed risk-taking exposes an individual's risk preference by assessing their behavior once an uncertain circumstance occurs (Becker, 1990). Their findings align with Sitkin and Pablo (1995), who label actual risk aversion as risk propensity, stating it is more related to the knowledge level and experience of the individual. Hence, younger individuals' level of risk aversion is more subject to change than older individuals. On the other hand, perceived risk aversion is mainly an effect of framing, as mentioned previously. Culture also plays a part in risk perception. Hsee and Weber (1999) studied the difference between perceived risk aversion and actual risk aversion by asking respondents different questions. They found that collectivist cultures such as Chinese and Korean estimate their level of risk aversion higher than it is. The contrary was found for the individualistic American sample. Americans tend to think they are willing to take on more risk than they do. Poland places right between an individualistic and collectivist culture, with the citizens being more individualistic than the average of all countries (Hosftede and Minkov, 2010). On the contrary, the culture in The Netherlands has scored the highest, with its society being highly individualistic (Hofstede and Minkov, 2010). Perceived risk aversion, therefore, plays an essential and multifunctional aspect in risk management.

### **2.1.2. Risk Management**

In the context of strategic management, risk management has observed a surge in levels of interest over the years (Crouch and Wilson, 1982; Allan and Beer, 2006). All strategic decisions involve risk, as each decision revolves around some level of uncertainty, where each outcome has a different level of probability (Pablo et al., 1996). Rejda (2011, pp.43) defines risk management in terms of loss exposure - "risk management is a process that identifies loss exposure faced by an organization and selects the most appropriate technique for treating such exposures." Loss exposure is seen as any situation in which a loss is one of the possible outcomes. The futuristic perspective on risk management argues that it is "what people do to be prepared for the ambiguous future." It acknowledges that people are unable to predict what will happen in the future accurately.

Nevertheless, by focusing on alternatives, one can be prepared and embrace the uncertainty (Inayatullah, 2008). Even though the concept of risk management appears straightforward, its implementation is far more complex and challenging to tackle (Nocco and Stulz, 2006). One of the main obstacles in implementing an effective risk management strategy is making risk

management an organization-wide concern. Risk is not to be dealt with by a limited number of people within the company, but ownership should be spread across different levels (Nocco and Stulz, 2006). Another challenge is that people mistreat risk due to behavioral biases (March and Shapira, 1987). This links to the previously mentioned difference between actual and perceived risk aversion, where behavioral biases can influence the perceived risk aversion of colleagues or subordinates (Pablo and Sitkin, 1992). Previously they have already identified that organizational characteristics can influence decision-making. These, in addition to outcome uncertainty, expectation, and potential, are dimensions that consciously or unconsciously influence decision-makers in uncertainty (Pablo and Sitkin, 1992).

Risk management is one of the ways in which a company can gain a competitive advantage by relying less on innovative strategies and shifting its focus on dealing with the uncertainty emerging from continuous changes in technology and customers' preferences (Chatterjee et al., 2003). Elahi (2021) suggests that the volatility of the business world is only going to worsen in the years to come. Therefore, it is clear that risk is a crucial and inevitable element of strategic management that businesses should focus on to cope with increasing ambiguity and its associated risks (Tapera, 2014).

### **2.1.3. Measuring Risk Appetite**

In order to focus on strategic risk management, it is essential to uncover how to measure risk appetite and determine what drives it. People face situations that require different levels of risk-taking daily. Those situations vary across domains, starting with recreational decisions and ending with financial or health choices (Weber et al., 2002). In order to understand how strategic risk decisions are taken on behalf of a company, one must first understand how managerial risk priorities are shaped (Chatterjee et al., 2003). Research demonstrates that risk influences decision-making, as it shapes an individual's perception, alternatives assessment, and decision in an uncertain situation, as these decisions involve various psychological processes (Hoskisson et al., 2016; Weber et al., 2002).

A wide variety of methods has been used to elicit individual risk-aversion and its impact on decision-making (Anderson and Mellor, 2008; Charness et al., 2013). The research usually involves offering a lottery type of choice between an option that guarantees a certain amount of money and a second, riskier option that confers a possibility of gaining more but also losing

everything (Kahneman and Tversky, 1979; Weber and Johnson, 2008; Holt and Laury, 2002; Hardeweg et al., 2013). This scenario depicts risk aversion as the eagerness to avoid outcomes with a high variation. Due to the simplicity of this method, it has been used in many studies conducted in developed and developing countries (Dohmen et al., 2010; Guiso et al., 2013). Alternatively, Barsky et al. (1997) has offered interviewees job opportunities that led to diverse lifetime endings and asked them three questions with yes/no answers. This task has allowed him to classify those individuals into four different risk-aversion groups. It was concluded that the non-monetary values could have impacted the decision and, therefore, the results of this particular method.

Further methods consist of Likert scales (Dohmen et al., 2011), items response theory (Arrondel et al., 2004), domain-specific risk-taking scales (Weber et al., 2002), or monitoring behaviors such as smoking. Measures used are an essential aspect of existing research because a significant part of the debates revolve around whether risk aversion is stable or varies regardless of the method used. Besides the growing literature on risk preferences measurement, there has been a comparison between risk aversion methods in developed and developing countries (Hardeweg et al., 2013; Ding et al., 2010). This research aimed to investigate the measure that best predicts the risk behavior of an individual. Results showed that a simple survey-based measurement could provide valuable evidence on individuals' risk attitudes. Charness et al. (2013) classified different risk-aversion measurement methods based on their complexity. They highlighted that even though the methods deemed more complex provide a more accurate estimation of the risk parameter, they do not predict risky behavior better. Treibich (2015) supports the findings of Hardeweg et al. (2013) that discovering the willingness to risk is easy to uncover in a survey. This research, however, warned that a too broad domain definition could alter the survey results as individuals might interpret it in different ways. It is, therefore, understandable that measuring risk aversion is still seen as highly challenging and continuously debated by scholars (Treibich, 2015). Research into measuring risk aversion falls in a broader category that measures human behavior called behavioral economics. While measures decide how respondents provide their answers on specific topics, behavioral economics reveals why they have responded in the way they did.

#### **2.1.4. Prospect Theory**

Numerous studies have focused on the relevance of psychology on economics (Simon, 1955; Camerer et al., 2004). Knowledge constraints and computational capacities limit the human ability to process information, which is a cause of suboptimal decisions (Loasby and Simon, 1985). Analyzing and interpreting people's minds concerning the world they were brought up in is critical for a deeper understanding of decision-making (Kahneman, 2003). Behavioral economics is part of a wider field of behavioral and social sciences distinguished by a thorough understanding of the human brain (Camerer et al., 2005). Moreover, behavioral economics uses the traditional economic model to account for the psychophysical properties of desire and judgment, which creates limits on logical estimation, willpower, and greed (Camerer et al., 2005).

The central theory of behavioral economics is known as prospect theory. Prospect theory depicts how individuals decide when faced with risk and ambiguous outcomes (Kahneman and Tversky, 1979). Scholars use it to justify their hypotheses focused on risk and interpret/predict choices made by the individuals when the outcome is unclear (Bowman, 1982; Fiegenbaum, 1990; Lehner, 2000). In the 1970s, the expected utility theory was perceived to demonstrate best the behavior individuals have when making risky decisions (Arrow, 1958; Friedman and Savage, 1948). This perception changed in 1979 when Kahneman and Tversky offered a new systematic rationalization to behavioral irregularities, a revolution in behavioral economics. Prospect theory describes that when faced with prospects where risk and ambiguity are involved, individuals will think about expected gains or losses in relation to the point of reference rather than complete results and the probability of certain outcomes (Schneider and Lopes, 1986). It depicts that if individuals are faced with prospects involving gains, they will be seen as risk-averse.

On the contrary, when discussing prospects involving losses, individuals will be seen as seeking risk (Kahneman and Tversky, 1979). The theory demonstrates three possible ways to alter risk preferences. The first one is loss aversion; the second is the framing of the problem, and lastly, the weighting of outcome probabilities. These factors are also mentioned in Pablo and Sitkin (1992). The scenarios presented to the decision-makers primarily refer to monetary choices; however, the concept can be applied to other situations where risk is involved in the decision-making (Levy, 1992).

One of the most important findings of prospect theory is that people make their decision with a particular reference point (Kahneman and Tversky, 1979). This reference point is caused by how individuals think, focusing on gains and losses rather than assets they possess. Authors typical experiment by including two different questions, each having two possible options. In the first scenario, they were asked to decide between choosing a certain amount of money or gambling with an 80% probability of gaining more money than in the first option and a 20% probability of receiving nothing. The latter scenario was created similarly; however, individuals were faced with negative prospects. They could either lose a certain amount of money for sure or make a gamble with 80% of losing even more money and a 20% chance of not losing anything. The results have shown that when it comes to the scenario focused on positive prospects, 80% of the respondents decided to opt for a certain outcome. However, in the second scenario, 92% have decided to gamble instead of being faced with a certain loss. It was concluded that, in both cases, individuals decided to opt for the choice that had a lower expected value. This finding is not consistent with the expected utility theory, which was perceived as the best determinant until now (Kahneman and Tversky, 1979).

People tend to be riskier when reflecting on losses than on gains is linked to people being far more irritated when faced with a loss of a certain amount of money than happy when they gain this same amount (Charness and Rabin, 2002). This pattern's effect is that individuals favor a status quo or, as previously mentioned, a particular reference point over any other alternatives. Those alternatives include gambles with 50% chances of losing and winning as well as negative outcomes. Furthermore, this observation means that people appreciate current belongings more than equivalent things they do not possess. This finding is described as the endowment effect (Thaler, 1980) and is applicable even for small objects like sweets or toys. This finding does not apply to commercial transactions as spending money on goods neither leads to loss aversion nor endowment (Kahneman and Tversky, 1979).

As previously stated, it is crucial to determine the reference point, or so-called *framing*, as the results are encoded in terms of a reference, leading to different gains and losses perception. Kahneman and Tversky (1979) have made this noticeable in the experiment conducted for their study. They confronted two different groups with a hypothetical scenario and asked them to choose between 2 programs where 600 people were predicted to die due to a disease outbreak. However, while one group was given the option of saving a certain number of people ("survival frame"), the other group was given the same choices but with the option of killing a certain

number of people ("mortality frame"). As a result, the majority (72%) preferred the more cautious alternative in the survival frame; however, when it comes to the mortality frame, the risky alternative was preferred by a similar majority (78%). Moreover, the survival frame induces a downward shift in the reference point, similar to adding a positive constant to all outcomes. This downward translation effect (Abelson and Levi, 1985) influences outcomes as it increases people's risk aversion.

After the discovery of prospect theory, several scholars tried to add to the topic. One observation depicted that organizations put innovation on hold when faced with extreme performance errors and solely focus on the errors (Chattopadhyay et al., 2001). Focusing on errors has worked for organizations in the past. It motivated managers to adopt a survival frame that reduces their overall risk-taking even when they are below their reference point (Chattopadhyay et al., 2001; Jawahar and McLaughlin, 2001). It was also discovered that the size of an organization, as well as organizational slack, can have an impact on the framing, in the context of managerial risk-taking (Chattopadhyay et al., 2001; Singh, 1986) and lowering the risk when they allow losses to be sustained (Hayward and Shimizu, 2006). Other additions to the prospect theory have to do with ambiguity (Shimizu, 2007) or transferring responsibility (Hayward and Shimizu, 2006).

## **2.2.Demographics**

Early studies primarily examine risk-taking in relationship to individuals and their investment in risky assets or other monetary terms. More recent studies include a more comprehensive range of variables that could impact one's decision-making (Outreville, 2013). Those variables mainly include traits such as gender or age. Factors such as nationality, ethnicity, employment, education, or health status are often not considered (Anderson et al., 2004). While it can be argued that those characteristics may affect an individual's risk tolerance, it is also probable that their risk tolerance has an impact itself on the lifestyle choices that those individuals decide to pursue (Outreville, 2013).

### **2.2.1. Nationality**

Culture has multiple definitions and multiple methods of use based on the differences in those definitions. In a broad sense, culture can be defined in many ways; this paper uses the definition proposed by Franz Boas in the 1900s, emphasizing that culture is diverse, can be formed by different nations and societies, and is based on historical events (Spencer-Oatey, 2012). Damodaran (2007) argues that no significant differences associated with risk aversion could be observed when referring to culture or race. In contrast, Hofstede and Minkov (2010) concluded that demographic differences impact risk aversion.

In a broad sense, cultures can be divided into individualistic cultures and collectivist cultures. Under the Cushion Hypothesis, collectivist communities tend to be less risk-averse (Tavor, 2019). This is caused by the perceived feeling of safety from the community in case of severe financial loss. Individualistic communities, on the other hand, are more self-sufficient and receive less support from their surroundings. Therefore, people in these communities tend to be far more risk-averse when compared to collectivist communities. Hsee and Weber (1999) studied perceived risk aversion and found that collectivist cultures such as Chinese and Korean populations studied estimated that their level of risk aversion is higher than it is. The contrary was found for the individualistic American population they studied. Americans tend to think they are willing to take on more risk than they do. On the other hand, Tavor (2019) Mentions that the collectivist communities can also provide too much safety for their members. This reduces members' financial knowledge to a level where it causes them to become more risk-averse, creating an opposite effect.

Cultural differences play an important role in making decisions investment (Majewska-Bielecka, 2012). It is renowned that investors from the South of Europe can be more intuitive. In contrast, investors from the North tend to be more methodical and meticulous in examining the elements. The American society, which has for years adhered to individualism as one of its main values, makes decisions rather quickly after assessing the main elements (Majewska-Bielecka, 2012). The Japanese may surprise with the most strange and unexpected questions while, for example, the Dutch tend to get to the point fast (Niedzielski, 2004). People from different cultures perceive risk differently, have different ways of conceptualizing risk, or attach different importance to distinct risk classes (Studenski, 2004). There is ample evidence that risk-taking is a behavior that is determined not only by individual risk appetite but also by cultural factors specific to particular societies (Studenski, 2004). For example, Holler (1983) refers to replications of the experiments conducted by Kahneman and Tversky (1979), in which differences were detected with regards to risk perception related to the nationality of the respondents (Studenski, 2004). The differences in uncertainty avoidance amongst IBM employees at IBM plants in individual countries were noticed by G. Hofstede, a Dutch engineer and social psychologist (Majewska-Bielecka, 2012). Throughout studies conducted in the 1960s and 1970s, the uncertainty avoidance index (UAI) was determined for 70 countries from three geographical regions. According to Hofstede's definition (2011) uncertainty avoidance refers to the degree of comfort members of a culture feel in situations that are unstructured or unfamiliar and the extent to which "a society tries to control the uncontrollable" (Litvin et al., 2004). The index comprises people's behavior in unclear situations, which can also be generally applied to attitude towards risk (Majewska-Bielecka, 2012).

Cultures that score high on the UAI are less comfortable with ambiguity and are more likely to follow the rules or regulations to control the level of uncertainty they will have to face (O'Connell, 2013). Those cultures attempt to follow formal laws and implicit rules to manage situations that they find ambiguous. On the contrary, countries with lower UAI feel more comfortable facing uncertainty and are more tolerant of risk-taking and making change (O'Connell, 2013). In a business setting, people from countries with a high UAI tend to be more patient and take time to discuss risk management. It is also expected that those individuals reject proposals that seem too risky because those propositions fail to take risk and uncertainty into account and do not encompass ways of coping with risk and uncertainty. When it comes to countries with low UAI, citizens are expected to work more dynamically. New ideas are

presented and implemented quickly; decisions are made fast without exploring the whole dimension of ambiguity (O'Connell, 2013).

In the Uncertainty Avoidance Index published by Hofstede and Minkov (2010), results tend to be higher in East and Central European countries (i.e., Poland, Romania), in Latin countries (i.e., Spain), in Japan, and German-speaking countries (Hofstede, 2011). Lower scores were registered in English-speaking, Nordic and Chinese countries (Hofstede, 2011).

As shown in Figure 2, Poland and The Netherlands are highly differentiated in their level of uncertainty avoidance (UA). The level of UA for Poland is 93, which is far greater than The Netherland level of 53. A lower score in the UA index indicated that people in the country are more comfortable when faced with uncertainty, are more likely to take risks, and are less dependent on structured rules. Unstructured situations refer to those instances that are novel, surprising, or different from usual ones (Hofstede, 2011). To be more specific, cultures that display a high level of uncertainty avoidance are generally uncomfortable with unstructured situations (Litvin et al., 2004). Those same cultures value structure very highly and are threatened by ambiguous or unknown instances (Litvin et al., 2004). In contrast, cultures with low uncertainty avoidance are more willing to embrace risk (Litvin et al., 2004).

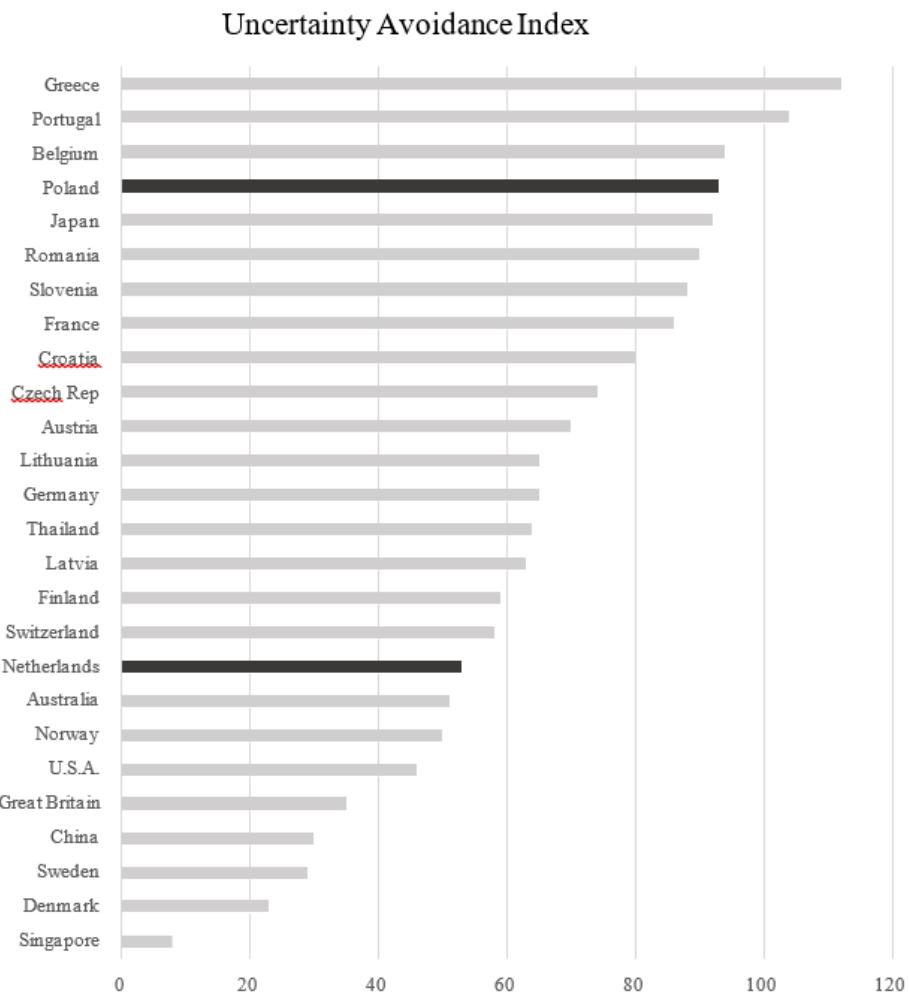


Figure 2: Uncertainty Avoidance Index Result per Country

Uncertainty-avoiding cultures aim to minimize the possibility of unstructured situations by creating strict behavioral laws, codes, and rules, disapproving of deviant opinions, and promoting the belief in absolute truth (Hofstede, 2011).

Various studies have shown that individuals in uncertainty-avoiding countries tend to be more emotional and influenced by inner nervous energy (Hofstede, 2011). On the other hand, uncertainty-accepting cultures appear to be significantly more tolerant of an opinion that differs from the usual thinking and have fewer rules (Hofstede, 2011). Individuals coming from uncertainty-accepting cultures are more contemplative and phlegmatic.

The previously mentioned studies coincide with the research of the degree of anxiety in the societies of 18 developed countries, conducted by R. Lynn in the 1970s (Hofstede and Minkov,

2010). The research showed that countries such as Austria, Japan, or France are characterized by high social anxiety. In contrast, countries like New Zealand, Great Britain, and Ireland are characterized by low anxiety. Both studies used entirely different data sources provides strong support for the results obtained and confirms the accuracy of the observation that the level of anxiety and avoidance of uncertainty varies from country to country (Hofstede and Minkov, 2010).

The observations mentioned above were partially confirmed in 1996 by K.E. Wärneryd, who conducted a study on the Dutch's attitude to risk and risky behavior and covered the entire representative sample of this nation. Wärneryd (1996) stated that there is a common tendency in The Netherlands to avoid risk when it comes to hypothetical choices between a smaller but sure win and a larger but uncertain win. As with Camerer et al. (1988), who studied stereotypes regarding the attitude to risk in various socio-economic and national groups in 1990, the declared attitudes towards risk had nothing to do with the riskiness of a person's securities portfolio. Wärneryd (1996) The study showed a significant propensity for the supposedly cautious Dutch to gamble (Tyszka and Zaleśkiewicz, 2001).

### **2.2.2. Age**

When the effect of age on management is debated, three main topics are often discussed: biological age, generations, and work experience. According to Birkinshaw et al. (2019), these factors all have their unique characteristics while still highly correlated. This correlation is partly caused by the passing of time. As people become older and go through major life events, individuals become more aware of their mortality and adapt their risk preferences accordingly (Birkinshaw et al., 2019).

Hignite et al. (2002) researched risk preference through competitiveness. Their study found that younger students were far more competitive than older students, making them more willing to take risks. This phenomenon is confirmed by McKenna and Richardson (1995), and more recently by Duell et al. (2017), who investigated willingness to take risks spread over different countries and age groups. The result was that the willingness to take risks gradually decreases after reaching its peak. On the contrary, research by Konovsky et al. (1987) and Krumov et al. (1997) both find no significant evidence of a relationship between age and risk aversion. Within organizations, it is essential to have a diversely aged employee pool, as it can bring significant

benefits in addition to the challenges it imposes (Birkinshaw et al., 2019). According to Birkinshaw et al. (2019), age was the most significant influencing factor on the chosen management style, followed by the level of seniority and gender.

Hignite et al. (2002) furthermore concluded that in addition to age, employees with more work experience are more risk-averse than young professionals. These findings are strengthened by results from Drory and Ritov (1997), Eidson (2003), and Birkinshaw et al. (2019), the latter of whom labeled this as the seniority effect. The natural cause hereof is that as people progress through more senior roles, they have had more experiences and time to learn. Most of all, however, higher positions are coupled with higher personal responsibility, which tends to make people more risk-averse.

Scott et al. (2005) defined a generation as an age group where everyone is born around the same time and matured together. In a management view, Birkinshaw et al. (2019) talk about the generational effect. The same group of people has identical values and expectations from sharing the period where they grew up. According to Stauffer (1997), values are one of the most significant differences between generations. Generation X, 1965-1980, is more independent than their baby-boom elders (Loomis, 2000). This trend is often highlighted in the literature as the differences get bigger with every generation. When asked whether one would work for the same company for their entire career, 70% of the silent generation agreed, 65% of baby boomers agreed. However, only 40% of Gen X and 20% of Gen Y saw themselves working for just one company for their entire career (Tolbize, 2008). The author presses the importance of the data being collected at one point in time; hence not everyone was asked at the same point in their life. Overall, literature on age depicts that people tend to seek stability once they get older (Valickas and Jakstaite, 2017).

### **2.2.3. Gender**

Besides age, gender is a common topic when discussing demographic differences in management. Collinson and Hearn (1996) described the historical gender division as "Man"-agement since the number of women in management or executive positions have historically been lower than that of men. This division is more extreme in certain countries; in Japan, for example, women account for less than 10% of the managers, while in the USA, they account for 43% (Catalyst, 2007). Historically, this division might be due to the number of women qualified for the job. However, by now, as many or more women enroll in university than men (Kyriakidou, 2012). Yet, while women enter the workforce with similar experience and qualifications as men, their career paths and salary develop in entirely different ways (Burke and Mattis, 2005). Kyriakidou (2012) warns that while women are becoming more educated and qualified for positions, they tend to study different specializations. Where men are more likely to study science fields such as mathematics and engineering, women more often resort to social sciences and languages. Therefore, while tertiary education levels are on the rise, the areas studied might not provide the best qualifications for a management position. The World Economic Forum predicted that global gender parity would take another 170 years to clear the gap at the current level of growth (Schwab et al., 2016).

The speed at which the gap is closing might be confusing, considering the research published on the benefits of having women in management. According to Voyer and Voyer (2014), women perform as well as or better than males across topics and education levels. Tarr-Whelan (2009) uncovered several positive developments for companies that employ more women in senior positions. These benefits range from higher profits, less hypercompetitive culture, a higher probability to survive an economic downturn to a more risk-aware organization. Brewer et al. (2002) found that both men and women tend to compromise and avoid handling conflicts. However, men more often sought to compromise, where women tend to avoid. Other studies by Slovic (1966) and Hignite et al. (2002) also found significant differences in risk aversion between genders. While most studies find differences between genders, some literature points towards an equal division, such as Eagly and Johnson (1990), who concluded that men and women who share an equal position mostly behave in the same way. Later research into the same topic by Korabik et al. (1993) yielded similar results. Croson and Gneezy (2009) confirmed that women are more risk-averse than men; however, they highlighted that gender differences in risk preferences become less significant and even disappear once the sample is

focused on managers or professional businesspersons. When comparing women and men from the business world, women behave the same way as men and reveal similar patterns (Croson and Gneezy, 2009). Faccio et al. (2016) compared the level of risk taken by companies by investigating companies that transitioned from male to female CEO, or vice versa. This allowed them to compare differences within the same firm rather than comparing different companies. They found that companies transitioning from a male to a female CEO will experience an overall reduction in corporate risk-taking. In contrast to the claim made by Voyer and Voyer (2014) that females in management positions achieve higher profits, Faccio et al. (2016) concluded that the change in risk aversion causes female CEO's not to allocate capital as efficiently as their male counterparts.

#### **2.2.4. Other Demographics**

Besides age, gender, and nationality, studies into risk aversion often reflect on the population's education and income level. According to Hartog et al. (2002), there are significant differences in the level of risk aversion across education levels. Their study measured education as the number of years studied and found that as participants studied longer, they were more accepting of risk. These findings are shared by Guiso and Paiella (2008) and Shaw (1996). Hartog et al. (2002) continued to explain that education itself might not drive the lower levels of risk aversion in these groups. The sample population discussed studied in an era where education was very costly. This could lead to a higher fear of failure when one does not manage to complete the program. Therefore, they mention that these factors might already limit the amount of risk-averse students upon entry. The real cost of tuition has continued to increase by as much as 390% between 1960 and 1980; hence, this argument still holds (Articulo, 2015).

Shaw (1996) highlights the strong correlation between education, income, and risk aversion. Risk-averse individuals have lower participation levels in education, which results in a lower income level. She then continues to expand on how education and income reduce the level of risk awareness the more education or income is gained. De Aghion and Gollier (2000) imply that besides income, income stability is a factor that dramatically affects risk aversion. His research concluded that individuals with an income that might be compromised in the future are far less accepting of bearing risk in the present. Haushofer and Fehr (2014) expanded on this concept and concluded that a lower income leads to short-sighted decisions that are predominantly risk-averse. The short-sightedness of lower-income individuals leads to a

circular process that can continue to worsen the situation for this group. Guiso and Paiella (2008, p. 1109) finally conclude that "risk-averse consumers are significantly less wealthy than the non-risk-averse consumers." Their study shows that the average risk-averse individual has €1,500 cash on hand versus €6,700 for less risk-averse individuals.

Religion is yet another factor found to impact risk aversion. The study conducted in Germany depicted that Muslims are the most risk-averse (León and Pfeifer, 2017). Even though Christians were willing to take more risks than Muslims, they were still unwilling to take as many risks as non-religious people (León and Pfeifer, 2017). Noussair et al. (2012) studied a Dutch population and found that the more religious people are, the more risk-averse they are. Moreover, the data suggested that the link between religion and risk preference is mainly driven by social aspects of belonging to the church rather than the beliefs themselves (Noussair et al., 2012).

There is also literature on the implications of marital status towards risk preferences. Multiple studies have shown that single people have a higher degree of risk aversion (Sunden and Surette, 1998; Barber and Odean, 2001). Amongst single people, women tend to have a more cautious attitude than men. It was also found that risk aversion significantly decreases the time to first marriage; the more risk-averse respondents are, the sooner they get married. On the contrary, a study conducted by Schmidt on the German population has shown that unmarried women are more risk-tolerant than married ones (2008). This proves the point of Gándelman and Hernández-Murillo (2015) that the decision maker's nationality has an impact on the decision-maker's risk preferences.

## Conclusion

The concept of risk has often been a source of confusion. There are numerous opinions amongst authors on the topic and its definition, whether discussing risk, risk aversion, risk management, or ways to measure risk. While opposing views exist, multiple authors find differences in risk aversion between countries. Yet, Schoemaker (2021) raises a relevant warning that it is often unclear whether papers discuss perceived or realized risk aversion. Multiple authors defined a split in types of risk aversion, stating that the perceived variant is led by anchors and framing of the problem, where realized risk aversion is more related to knowledge and experience. Whether a culture is more individualistic or collectivist determines how its citizens perceive

their level of risk aversion. As the volatility of the business world is set to worsen over the coming years further, it has become increasingly important for businesses to manage their risk. As all strategic decisions involve uncertainty, they create potential loss-exposures for businesses. Managing these uncertainties should be a central objective within an organization, as it was learned that organizational characteristics and problem framing could affect individuals, and therefore corporate risk aversion. Managing risk starts with measuring risk. The prospect theory leads the vast field of measures created to measure risk.

Risk appetite is often linked to demographics, as many scholars believe that demographics are the main factor that impacts how individuals behave in ambiguous situations. One of the most researched factors is age, with the central finding being that the older people are, the more risk-averse they become. Besides age, gender is another much-discussed demographic. Gender is found to be relevant due to its historic disproportional division in management. Though risk aversion is not the cause of this gap, there are observed differences in the risk aversion of men and women; women overall tend to be more risk-averse than men. Besides these two main factors, other demographics such as education, income level, religion, and marital status are discussed. Finally, nationality is a much-debated topic within the literature on risk aversion, as various opposing views exist. While several researchers claim nationality does not affect risk aversion, others have successfully proven the differences visible between nations. In an increasingly globalized world, where many companies operate with a multicultural workforce, it becomes more and more relevant to understand the implications of a homo or heterogeneous workforce on strategic risk management.

Even though the literature on risk is extensive, it is often generalized and does not portray the risk appetite that different demographics possess. Moreover, current literature often fails to distinguish between actual and perceived risk appetite, which are not the same and could potentially lead to different conclusions. Lastly, the literature is looking at each demographic factor independently. It does not provide a linkage between different factors, and most importantly, does not determine whether those views differ per country.

## **2.3.Hypotheses**

From the literature review, we have learned that risk has become an increasingly important aspect of strategic management. Various papers have been written on the factors that drive risk appetite in individuals. Yet, on all demographic factors discussed in the literature reviews, opposing views were found. One of the least researched factors, nationality, is evermore plagued by opposing views since few authors have tried to establish a consensus on the impact of nationality on risk appetite. The three other main demographic characteristics of age, gender, and education have been researched more often, though opposing views are persistent. Since nationality is the least researched factor, this will be the main focus of this paper. In order to uncover additional information regarding the other three factors, they will be reviewed in light of nationality. Therefore, the relatively broad main research question is defined as:

### **How do demographics impact risk appetite amongst Polish and Dutch business students in the context of strategic management?**

Two main hypotheses will be used, each of which will break down several characteristics that drive risk appetite and thereby the conclusion to the main research question.

According to Schoemaker (2021), it is often unclear which type of risk aversion papers discuss. Because this paper aims to link the effect of demographics on risk appetite to strategic management, we will answer the main research question based on actual risk appetite. Actual risk aversion will reflect on the inherent risk profile of individuals rather than on how their other opinion is shaped by framing in perceived risk appetite. This choice is made because companies can train their employees to be aware of anchoring and framing effects. They cannot change a person's inherent risk profile. Therefore this is directly linked to how the diversity in companies affects corporate risk management, rather than factors that can be influenced regardless of corporate diversity.

However, the literature found that the difference between perceived and actual risk appetite is often unclear. Because the authors expect both the demographic factors and nationality to affect actual and perceived risk, they have included several questions targeted at perceived risk appetite in the survey. This allows not only to confirm or deny the significance of the difference between actual and perceived risk appetite, but also it will serve as a check to assess whether perceived risk affects demographic factors differently. Therefore, the first hypothesis reads:

**H1: Perceived risk aversion and actual risk aversion are distinguishable.**

While the difference between perceived and actual risk is an overarching effect that is discussed throughout all variables in the paper, the effect of nationality is still at the forefront, driving the second hypothesis:

**H2: Dutch and Polish Business Students' risk appetite is distinguishable.**

This hypothesis will cover the main arguments driving the conclusion to the main research question. Its rejection will depend on discussing four topics that identify how the difference between the Polish and Dutch students' risk appetite is distinguishable. The authors proceed with this wide variety of tests in order to highlight how nationality can have a different effect on the way demographic factors influence risk.

With the main focus on the effect of nationality, the first topic will reveal on a high level whether there are differences between risk appetite amongst Polish and Dutch business students in general. Hereafter, the authors will dive deeper into what drives the impact of nationality on risk appetite. To do so, the effects of age, gender, and education will be discussed. For each of these factors, it will be established whether they impact risk appetite in general. Hereafter, the topics will be discussed in more detail to reveal any intermediate effects caused by nationality. This will uncover whether age, for example, impacts risk appetite only in one country, both, or neither. While the three factors overall might prove insignificant, it can still be possible that nationality, the moderating factor, causes different effects on a more detailed level. Therefore, besides assessing whether these factors on their own provide a significant impact to risk appetite, the authors will assess if nationality causes any underlying differences, as these could explain the opposing view in the existing literature.

### **3. Methodology**

#### **3.1. Research Design**

In order to uncover whether demographics have a relationship with risk appetite and therefore effect on strategic management, this research will adopt a non-experimental quantitative correlation research design (Creswell and Creswell, 2017). Quantitative research results can be tested for biases and are expressed in numerical form; therefore, they leave only limited room for interpretation. This causes the approach to be often praised with a higher degree of reliability (Mohajan, 2017). Through the quantitative approach, we will measure our variables to examine whether a correlation exists between them. This research method is in line with the methods chosen in the existing literature. This research utilizes a deductive research approach, which is common with quantitative research (Bryman and Bell, 2011). This approach is used to verify a theory by accepting or not accepting hypotheses the researchers have derived from the theory (Creswell and Creswell, 2017). Google Forms and Rstudio are used to measure and analyze the sample population's behavior, allowing the researchers to accept or not accept the hypotheses.

#### **Data Collection**

The analysis in this research will be based on primary data. This data is collected through a cross-sectional survey (Creswell and Creswell, 2017). In addition to providing good results, a survey also benefits the research through its turnaround time in data collection, which is specifically beneficial considering the time constraint for this paper (Fowler, 2014). The nature of survey data allows it to be readily generalized and quantified over large sample populations (Vogt, 2014). Surveys can be qualified as either longitudinal or cross-sectional. This paper utilizes the cross-sectional method as the data is collected at one point in time (Creswell and Creswell, 2017). The questions are distributed, and responses are collected digitally through Google Forms. Partially due to convenience sampling, the survey can be distributed in the direct surrounding of the authors, as they are surrounded by the Dutch and Polish sample populations. For additional responses, the authors will reach out to online groups followed by business students in the respective countries.

Risk attitude plays an integral part in determining individuals' choices; therefore, it is highly important to use a reliable and valid method for measuring people's risk preferences in a survey (Ding et al., 2010). Two valid and reliable approaches to survey creation have recently been proposed in economic literature. The first method refers to asking individuals to rate themselves on a risk avoider scale. This can be done by asking a question in general (Are you a risk-taker?) or about a specific domain in life (Do you feel comfortable investing in the stock market?) (Dohmen et al., 2005). The latter focuses on hypothetical situations such as lotteries (Donkers et al., 2001; Hartog et al., 2002). The survey was created using both approaches, with the first method chosen to measure the perceived risk of the respondents, while the second will focus solely on measuring actual risk appetite.

The survey consists of a series of closed-ended questions, starting with six questions to let the respondents self-identify their level of risk aversion. Those questions were created based on the first approach of measuring people's risk preferences in surveys, asking them to rate themselves on a risk avoider (or taker) scale. In these questions, respondents are asked to measure themselves through the five-point Likert scale, a psychometric response scale that measures the level of agreement to a particular situation (Likert, 1932). These questions are included because there is a clear difference between self-perception behind the stated risk preferences and their actual preference towards risk (Arslan et al., 2020). An example of a question with intent to measure the sample's level of perceived risk aversion is:

*"People who know me would describe me as a cautious person."*

The possible answers to those question are as follows:

<b>Strongly Disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly Agree</b>
1	2	3	4	5

In order to measure the actual level of risk aversion in a sample, the following six questions describe a hypothetical scenario to test a person's level of risk aversion. Those questions were created based on the work of Kahneman and Tversky (1979) and Dohmen et al. (2005), while their answers are related to hypothetical investment questions and lotteries. These scenarios provide the respondents with a certain probability of winning a monetary amount or an alternative where the probability is lower but the monetary amount is higher.

Using Hypothetical scenarios provides both advantages as well as disadvantages. This paper utilizes them because they provide situations where the sample cannot have a lot of predetermined knowledge, and therefore be biased. Therefore, these types of questions deliver a direct assessment of the sample's natural level of risk aversion. Camerer et al. (1988) warn that a set of hypothetical scenario questions can differ so much from each other that researchers will end up comparing different settings. In order to prevent this, all questions are linked to the same topic; monetary loss or gain. An example of a question created based on previous research:

*Imagine you are playing a lottery. Which of the following two lotteries would you prefer?*

The possible answers to those question are as follows:

- A. 4% probability of winning 400 euro
- B. 2% probability of winning 800 euro
- C. No preference

Finally, the survey will include questions to identify the demographic characteristics of the sample population. Out of the demographic factors researched in the literature review, age, gender, and education level were chosen because they are demographic factors that are relevant in the setting of strategic management. Other factors such as religion and marital status are often not considered when hiring employees. The complete list of questions can be found in Appendix A.

## **Sample Population**

The sample population discussed in this paper is business students from The Netherlands and Poland. The sample population is limited in order to be able to gather a representable number of results within the timeframe. Since the implications of this paper are to be discussed in the field of strategic risk management, the sample should reflect individuals who are likely to end up in such positions in their careers. Therefore, this paper focuses on current business students, as these are perceived as the future generation of managers. Hereafter, the authors aimed to limit their sample population to two cultures geographically; The Netherlands and Poland. It is not a coincidence that these are the home countries of the authors. With limited time available for the research, the authors' home countries' readily available and representative respondents provide a perfect example of convenience sampling. Convenience sampling occurs when a

relevant target population is within easy reach of the researchers, which causes them to be biased towards taking this sample rather than a different, perhaps even better, sample population (Cochran, 1977). The authors have established that their bias towards their home countries does not hinder the research from the literature review. Hofstede and Minkov (2010) and Gándelman and Hernández-Murillo (2015) researched risk aversion differences between nations; both concluded that there is a significant difference in the level of risk aversion of the Dutch and Polish. Therefore, the authors deem the sample relevant for comparison to provide clarity on the opposing views by Damodaran (2007).

To assess the sample size, the Cochran formula for sample population is utilized (Cochran, 1977).

$$n_0 = \frac{Z^2 pq}{e^2}$$

*Equation 1: Cochran Sample Size*

As generalizable results are sought, test results are to be significant. According to Creswell and Creswell (2017), statistical test results are considered significant when it is implausible that the results could have occurred by chance. The Margin of error represents " $e$ ," and a confidence interval of 95% corresponds with a  $Z$  value of 1.96.  $P$  represents the percentage of the population considered in the sample population, where  $q = 1 - p$  (Cochran, 1977).

This research will investigate Dutch and Polish people currently pursuing a tertiary degree in business administration. According to the latest available data, there are currently 0.8 million students pursuing a tertiary degree in The Netherlands and 1.5 million in Poland. Out of these students, 28.5% of the Dutch and 16.0% of the Polish opt for a degree in business administration. Over the entire population of both countries, 20.5% of students fall within our sample, resulting in our P-value. Given these inputs, the Cochran formula for sample size returns a minimum value of 170 respondents to our survey. The survey was created on Google Forms and shared directly with the target group from the author's contacts. In addition, the survey was posted on Facebook groups for students of business studies. These groups are specifically created for our target sample, and it was mentioned multiple times throughout the survey, which it was intended for. In addition to that, the authors only directly sent the survey to people who fall in the target sample. Therefore, the legitimacy of the sample is assured.

### **3.2. Model Selection**

The purpose of the empirical analysis is to prove that the results from the survey studied in this paper are significant. If we manage to prove the significance of the results in this study, we can verify that there is no chance that our results occurred coincidentally. Proving significance requires several tests depending on the characteristics of our data. In the following chapter, we will elaborate on which tests were performed and why.

Once the survey results were collected, they were prepared for data analysis in Microsoft Excel. Here, the authors assigned numeric values to the five-point Likert scale styled answers received from the respondents, where five signified the highest level of risk aversion and one the lowest. The quantified results were analyzed using Rstudio, an open-source professional software package for data analysis. The authors chose Rstudio because of its relative ease to use, thanks to its open-source library of packages. Packages are bundles of preprogrammed (statistical) functions that are readily available. For this analysis, the following bundles were used: “DescTools,” “Effsize,” “Stats,” and “Rcompanion.” These packages contained the tests that will be further elaborate on in the coming chapter. The authors chose to use a two-sample T-test and the nonparametric equivalent for this analysis. Because of their familiarity with these tests, it proved a time-efficient and reliable method of analysis. The authors acknowledge that other methods, such as an ordinary least-squares test, could have been used to yield equally interesting results.

In order to uncover which statistical model will allow us to prove the (in)significance of the results in our survey, it is essential first to understand the characteristics of the sample data further. The characteristics will determine which model is the best fit for our data. The widely used T-test is taken as the basis for the statistical analysis. However, before this model can be used, we have to test whether our data satisfies the model's requirements. In order to reliably use a two-sample T-test, we have to ensure our data is normally distributed and the variances of both samples are equal. If either of these requirements is violated, alternative methods will be used to support the shortcomings of the sample data.

The normality of our sample data will be tested first. This is an essential step as it determines whether a parametric model should be used to analyze the sample, or in case of non-normality, a non-parametric model (Prabhaker et al., 2019). According to the central limit theorem,

violation of normality is acceptable for a sample over 100. To provide a reliable conclusion, it is important to assume normality regardless of the sample size (Altman and Bland, 1995). If the data is distributed normally, it has to be presented as a mean value used to compare groups by calculating the significance level (p-value). However, if the data is not normally distributed mean will not depict a representative value. An incorrect selection of a data set's representative value and subsequent calculation of the significance level using this representative value could result in incorrect interpretation (Indrayan and Satyanarayana, 1999). As a result, it is crucial first to determine if the data is normally distributed and then establish if the mean represents the data's representative value.

There are two main methods to test data normality, each coming with advantages and disadvantages. The numerical approach has the advantage of objectively determining the normality, yet in some instances, it experiences sensitivity issues (Indrayan and Satyanarayana, 1999). When the sample size is small, the approach is not sensitive enough; with large samples, the approach is overly sensitive. The alternative approach is graphical interpretation. This allows for a good judgment when the numerical test is overly sensitive or not sensitive enough (Indrayan and Satyanarayana, 1999). However, it is more difficult to use and requires experience. As the authors do not have experience in graphical tests, the numerical methods will be followed.

$$W = \frac{\left( \sum_{i=1}^n a_i x_{(i)} \right)^2}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

*Equation 2: Shapiro-Wilk Test for Normality*

The most widely used numerical methods are the Shapiro-Wilk (S-W) and Kolmogorov-Smirnov (K-S) tests. The S-W test is more appropriate when dealing with a small dataset, while the K-S test is used for handling large datasets. It has been brought to attention that K-S is highly sensitive to extreme values and, due to its low power, it should not be immediately used to test normality but rather used as a backup (Thode, 2002). On the other hand, the S-W test is recommended for everyday practice and is considered the best choice for testing data normality (Thode, 2002). Therefore, this paper will solely use the Shapiro-Wilk normality test (1965). The test is utilized to establish whether our data is normally distributed. The null hypothesis of the Shapiro-Wilk test is that the tested sample population is normally distributed. Therefore, if

the corresponding *p-value* is lower than the alpha level set for this paper at 0.05, then the null hypothesis can be rejected as sufficient evidence is found that the data is not normally distributed.

Once it is confirmed that the data is normally distributed, the logical next step would be to perform an F-test before the T-test to ensure that the variances of the two samples are equal. However, it is worth noting that an alternative exists called the Welch's test. This modification of the T-test is known to correct the problem of deviating variances. This correction is performed by default in Rstudio but can be tweaked using the var.equal=TRUE/FALSE argument in Rstudio. This paper utilizes the Welch test to correct for any deviating variances in its T-tests. The T-test indicates whether the mean of the two samples is significantly different from each other.

$$t = \frac{m_a - m_b}{\sqrt{\frac{S^2}{n_a} + \frac{S^2}{n_n}}}$$

*Equation 3: Two-sample T-test*

If the data is not normally distributed, the Mann-Whitney *u* test has to be used. It allows two non-parametric variables to be compared without assuming that they are normally distributed. The test is the non-parametric equivalent of the T-test, which is used for normally distributed variables. In case it is unsure whether the data is normally distributed, alternatives are the Levene's test or the fligner-Killeen test, as these are less sensitive to deviations from normally distributed data. The null hypothesis of the test states that the median in each variable is identical to each other. In other words, when a respondent from each sample is drawn, there should be a 50% probability that respondent one will exceed respondent two. Therefore, if the *p-value* is lower than the assigned 0.05, we can successfully reject the null hypothesis and conclude a significant difference between the two variables. The Mann-Whitney test assumes that while the two variables are not normally distributed, they have to follow a similar distribution.

$$U_1 = R_1 = \frac{n_2(n_1 + 1)}{2}$$

*Equation 4: Mann-Whitney U-test*

### **3.3. Validity and Reliability**

Validity and reliability are essential elements for a study as they help draw meaningful and valid conclusions from the measured variables (Cresswell and Cresswell, 2017). According to Bryman and Bell (2015), different research designs result in different weightings of significance for validity and reliability. When it comes to validity, it can be classified into three different aspects being content validity, criterion validity, and construct validity (Muijs, 2010).

#### **Content validity**

Content validity is depicted as “the degree to which elements of an assessment instrument are relevant to a representative of the targeted construct for a particular assessment purpose” (Haynes et al., 1995, p. 238). In other words, it describes whether the elements of the research measure the content they were supposed to measure (Lynn, 1986). One way of establishing validity is through qualitative reviews, the main criteria being theory conformity regarding what the concept is and how it works (Muijs, 2010). In order to create a valid instrument, the theoretical definitions of the concept have to be analyzed. The more precise the calculation of the target construct is, the higher the content validity of a test is (DeVon et al., 2007). Even though content validity tends to receive little attention in the research, it is necessary for other characteristics of construct validity.

The questions used in the survey have been developed after the literature review had been completed. Therefore, it accounts for any gaps found in previous literature. Additionally, because the literature has been extensively reviewed prior to the development of the questions, it was ensured that no theoretical concepts are used wrongfully. Prior literature has also been beneficial regarding content validity because the examples used in other studies to make a particular risk concept easier to measure and understand by the respondents have provided the basis for developing questions used in the survey for this study. Furthermore, the questions provide a list of possible answers, which increases the accuracy of the results by limiting answers that would not contribute to this study. This further solidifies the argument of avoiding using open questions in the survey. For all of the above reasons, content validity has been ensured in this research paper.

## **Construct validity**

Construct validity aims to ensure that the operational measures chosen are assessing the right concepts (Bryman and Bell, 2015). Construct validity is particularly important in psychology, where the nature of the study is the measurement of human differences from abstract constructs (Anastasi and Urbina, 1997). Even though construct validity is highly important, no easy method quantifying the degree to which a measure is validly constructed exists (Westen and Rosenthal, 2003). In addition, failure to identify the proper operational measures can lead to subjective data interpretation (Yin, 2009).

In this paper, construct validity was ensured primarily by how the test, namely the survey, was developed and shared with the relevant sample. It has already been established that this research will be merely focusing on Dutch and Polish business students. Consequently, the survey was developed to choose between two identification options: either a Dutch business student or a Polish business student. By making the options exhaustive, we aim to ensure that individuals outside the sample will refrain from completing the questionnaire – since they cannot identify themselves as either of the two aforementioned options. Additionally, the researchers have only shared the survey directly to people who fit one of the two categories relevant to the study or on social media groups that merely encompass business students in The Netherlands or Poland. The purpose was introduced and explained at the start of the survey. This way potential respondent understands whether they suit the sample of the study. For all of the above reasons, construct validity has been ensured in this study.

## **Criterion validity**

Criterion validity, just like content validity, is highly linked to the theory (Muijs, 2010). Criterion validity is split into two types, namely predictive and concurrent validity. It depicts whether the instruments used (for example, questions in a survey) predict answers that can be expected based on the theory of whether the outcome correlates with other, previously gathered results (Creswell, 2014). In the content validity section, it was previously established that the questions in the survey had been entirely developed once the literature review had been fully completed. This approach was selected to ensure that the survey is created so that it not only correctly covers theoretical concepts but also provides a bridge between gaps in prior studies. Additionally, this approach ensures that theoretical concepts or ideas are not used inaccurately in researching a particular topic through the survey.

As mentioned, the questions used in this study were included in prior studies but altered to fit the purpose of this paper. For instance, it was observed that very few questionnaires in prior studies make use of open questions because of their general subjectivism, lack of clarity in some instances, and difficulty in quantifying the results. Risk is a topic to be interpreted on a case-by-case basis; various people will assess risk entirely differently based on various factors. Consequently, this research also refrained from using open questions. For these reasons, criterion validity has been ensured in this study.

## **Reliability**

In order for results to be valid, they should first and foremost be reliable. Reliability refers to consistency with which a system tests anything and ensures that a study can be repeated and deliver consistent results if the settings are the same (Bryman and Bell, 2015). “The goal of reliability is to minimize the errors and biases in a study”; thus, it ensures consistent measurement over time and across various components of values observed (Yin, 2009, p.45). Objectivity and limitation of subjective evaluation possibilities are essential criteria in the research (Twycross and Shields, 2004). First of all, this paper follows a quantitative approach where the degree of reliability should generally be higher than in qualitative research as there is limited possibility for interpretation.

In order to validate the reliability of the data used, the sample size was filtered. In preparation for the regression analysis, the choice was made to trim the age span to a span that is to be expected of either Bachelor's or Master's business students. Therefore, only respondents aged over 18 and under 30 were included in the regression. This choice was made based on the assumption that students enter university the earliest at this age and spend around six years there for a Bachelor's and Master. In addition to this, the upper age limit is higher to account for gap years, study delays, or other events delaying the start of university at this age. The choice was also made to disregard nonbinary gender respondents, as this group is too small in our sample to be significantly represented.

## **4. Empirical Results**

This chapter consists of two parts, with the first part representing the descriptive statistics. This will introduce the reader to the survey on a broad level. The sample characteristics are discussed to give an early insight into how representable and balanced the sample is. Age is highlighted explicitly because it is the sole non-binary demographic measured. Furthermore, the mean responses and questions that do not require statistical analysis will be discussed. The second part consists of the regression results. As previously mentioned, the authors took on a wide variety of tests to capture the effect of nationality on actual and perceived risk appetite. Therefore, to provide a good flow of the regression results chapter, only the significant results will be presented in the chapter itself. Insignificant results might still be relevant and will therefore be discussed here but presented in Appendix D. Finally, this chapter merely serves to present the data; its implications will be discussed in the chapter hereafter.

### **4.1. Descriptive Statistics**

#### **Demographics**

The original sample consists of 186 respondents. However, as mentioned in the reliability section of the previous chapter, it is essential to ensure that our sample fits the purpose of the research. Therefore, respondents below and above the age limits were excluded from the sample. In this chapter, the sample as tested in the regression analysis will be discussed. This sample is visualized in Table 1 below. The results for all of the respondents are visible in Appendix B, and an identical table for all collected data can be found in Appendix C. As visualized in Table 1 below, with 54%, most respondents originated from Poland, and the remaining 46% were Dutch. The Dutch sample population has a gender split of 53% men and 47% women. The Polish population consisted of 32% men and 68% women. Three participants either preferred not to disclose their gender or identify as non-binary. This group is too small to be representative and will therefore not be analyzed as a separate group. Their results will rather be aggregated in the total results. The overall gender division is 42% male, 58% female, which is relatively equal.

In the field of education, an even split is observed between Bachelor and Master students. Over the total sample population, 53% were pursuing a Bachelor's degree in business administration, and 47% a Master's degree in business administration. When split between the two countries, we observe that Bachelor students dominate the Dutch sample population, where Master students outnumbered the Bachelor students in Poland.

	Demographics		
	Total	The Netherlands	Poland
<b>Gender</b>			
Total	147	68	79
Male	61	36	25
Female	83	31	52
Other	3	1	2
<b>Age</b>			
Min	19	19	21
Max	29	28	29
Average	24	24	24
Median	23	23	23
<b>Education</b>			
Bachelor	78	40	38
Master	69	28	41

Table 1: Descriptive Statistics – Demographics

## Age distribution

To further assess the demographics of the sample population in this research, a closer look will be taken at the age distribution, visualized in Table 1 and Figure 3. In Figure 3, the vertical dark lines indicate where the sample was cut; all darker age groups were left out of the analysis. After cutting the sample, the age spanned from 19 to 29, averaging at 24 years old. When the split between the two countries is analyzed, similar observations are drawn; the average age in both countries is 24 years old. In all three observed splits, the median age was within one year of the mean age. From Figure 3 below, we observe a near-perfect normal distribution in the overall respondents' age division. After the selection is made, the age distribution represents the sample this research set out to analyze.

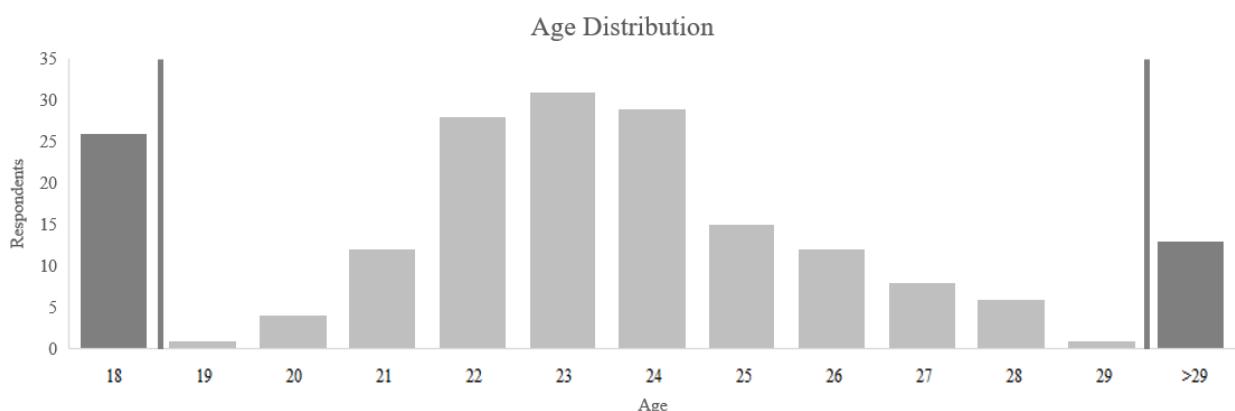


Figure 3: Age Distribution for both countries combined - Actual Risk Appetite

Questions 7-12 from the survey were set to determine the actual level of risk aversion. These questions are rated using the five-point Likert scale; the results can be seen in Table 3. Actual risk appetite results discover that the sample from The Netherlands is more risk-averse than the Polish one; however, the difference is not very large. Considering the subdivision in gender, it is visible that Dutch females are more risk-averse than Polish females and Dutch males are more risk-averse than Polish males. The differences between males from 2 different countries are higher than the differences between females. When it comes to age, the differences between participants aged 23 or lower are minimal between the countries.

Contrary to the results for participants aged 24 and higher, Dutch participants are more risk-averse than Polish. It can be seen that in Poland, actual risk aversion decreases with age, while in The Netherlands, it stays more or less the same. When it comes to education, the gap between Master's students from Poland and The Netherlands is much larger than the gap between Bachelor students from those two respective countries. When it comes to risk aversion, Polish Master's students are less risk-averse than the Bachelor's students, which is opposite to The Netherlands, Master's students are more risk-averse.

<b>Actual Risk</b>	<b>Total</b>	<b>Poland</b>	<b>Netherlands</b>	<b>Total</b>	<b>Poland</b>	<b>Netherlands</b>
<b>Average</b>	3,51	3,43	3,61			
<b>Median</b>	3,67	3,33	3,67			
Female				Male		
<b>Average</b>	3,49	3,45	3,56	3,54	3,39	3,65
<b>Median</b>	3,67	3,33	3,67	3,67	3,33	3,83
Age <= 23				Age > 23		
<b>Average</b>	3,6	3,61	3,59	3,43	3,25	3,63
<b>Median</b>	3,67	3,67	3,67	3,67	3,33	4,00
Bachelor				Master		
<b>Average</b>	3,49	3,50	3,48	3,53	3,36	3,79
<b>Median</b>	3,67	3,33	3,67	3,67	3,33	4,00

Table 2: Descriptive Statistics - Actual Risk Aversion

## **Gain/Loss perception**

An additional purpose of the survey was to uncover the relevance of the prospect theory depicted by Kahneman and Tversky (1979). When individuals are faced with prospects involving a gain, they are risk-averse; however, they are risk-takers when faced with a loss. In order to do so, the survey has included few questions capturing the perception that respondents have towards gains and losses. Firstly, two similar questions were asked, the only difference being that one outcome was presented as a gain (Q1 – question 7 from the survey) and one as a loss (Q2 – question 8 from the survey). Option A was seen as least risk-averse and option C as most risk-averse. The questions and possible answers to them were as follows:

*Q1. Suppose you can win a bonus from a gambling game through one of the following alternative winning ways. Which one would you like to choose?*

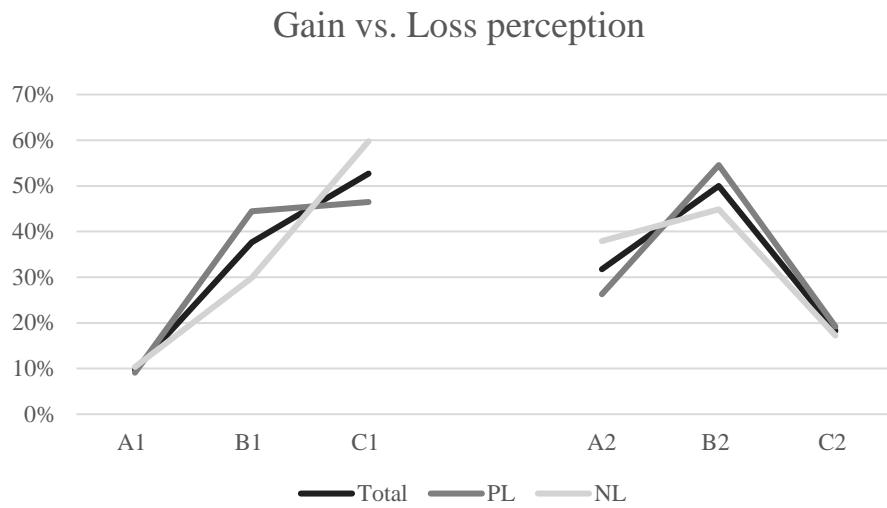
- A. 5% chance of winning €20,000 and 95% of winning no money
- B. 50% chance of winning €2,000 and 50% of winning no money
- C. Win €1,000 directly

*Q2. Suppose you will lose some money from a gambling game through one of the following alternative ways. Which one would you like to choose?*

- A. 5% chance of losing €20,000 and 95% of losing nothing
- B. 50% chance of losing €2,000 and 50% of losing nothing
- C. Lose €1,000 directly

The results can be seen in the graph below, representing the results for the overall sample and the Polish and Dutch populations separately. The lines on the left show responses to Q1, from which we observe that only 10% of each group opted for the riskiest option. Most respondents chose the most risk-averse option in each group. In The Netherlands, 59.8% of the population made this choice, while only 29.9% opted for the neutral option. When it comes to Poland, the number of people choosing the neutral option did not significantly differ from the number choosing the least risky option. However, more people still decided to opt for the safest option possible. When looking at the group together, the most risk-averse option was chosen by 9.7% of respondents, 37.6% of respondents chose the neutral option, and the riskiest option was chosen by 52.7%.

The lines on the right reflect Q2. The riskiest option was chosen by 26.3% of the Polish respondents and 37.9% of the Dutch respondents, totaling 31.7% for the entire population. Most respondents chose the neutral option in each country; 54.5% in Poland and 44.8%. In The Netherlands. The smallest amount of people chose the least risky option; 19.2% in Poland and 17.2% in The Netherlands.



*Figure 4: Gain vs. Loss Perception*

In addition to Likert-scale questions, the participants were also asked what they associate with the word ‘Risk.’ There were four answers provided, two positive answers; ‘gains’ and ‘opportunity,’ and two negative answers, ‘uncertainty’ and ‘loss.’ The results are visualized in Figure 5 below. 38% responded that they associate risk with uncertainty. The 19% that associate risk with losses brings the total negative associations with risk to 57%, a substantial majority. In comparison, 27% associated risk with opportunity and 13% with gain. The remaining 3% consists of other user-generated associations.

What comes to mind when hearing the word 'Risk'

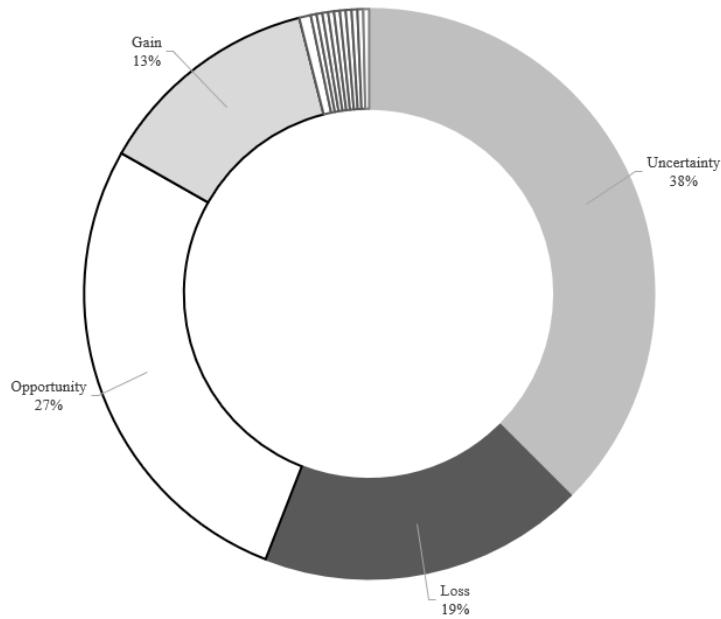


Figure 5: Perception of the word 'risk'

The results to the question about risk associations are similar on a country level, as shown in Figure 6. In both countries, most respondents have chosen the word “uncertainty” as one of the words they associate risk with. In each country, the word “uncertainty” was chosen more times than the word “opportunity,” which are opposite words in this. Between the associations of risk with “gain” or “loss,” the latter was more often chosen overall; 32.2% in The Netherlands and 28.3% in Poland. In comparison, “gain” was chosen by 26.4% and 16.2% of respondents, respectively.

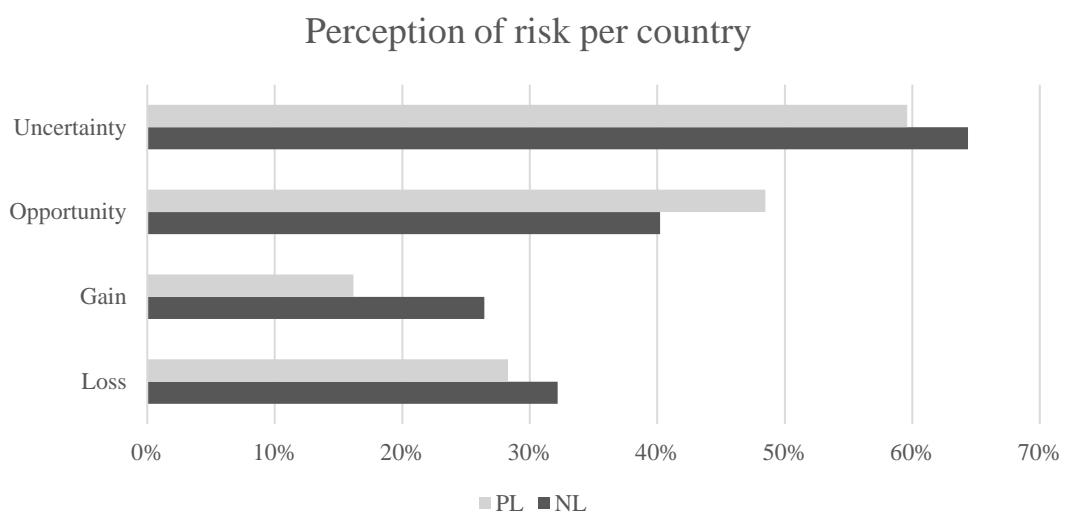


Figure 6: Perception of risk per country

## 4.2. Regression Results

### 4.2.1. Actual vs. Perceived Risk

Since the difference between perceived and actual risk is discussed throughout all tests, it is a normal course of action to test their difference on an overall basis first. When considering the overall sample, combining both countries, a highly significant difference at the 1% level is found between perceived and actual risk. According to Cliff's Delta, the effect of -0.2814 is just shy of being classified as a medium effect size. The test is repeated on a national level, where it becomes clear that this conclusion does not hold for Poland, where a P-value of 0.2370 concludes an insignificant difference. However, in The Netherlands, we find an identically significant difference at the 1% level, with an even larger effect size of -0.4533. Therefore, enough evidence is found to highlight how significant the difference between actual and perceived risk aversion is. The further discussed sub-tests will allow the authors to develop on how perceived risk deviates from actual risk.

Actual and Perceived Risk		Shapiro-Wilk normality test		Two Sample T - Test		Mann-Whitney U-test		Effect
		W	P-value		P-value	W	P-value	Delta
1	x = Actual Risk Aversion y = Perceived Risk Aversion	0,9867 0,9655	0,1807 0,0011			7451	0,0000	-0,2814
2	x = Actual Risk Aversion [Country = Netherlands] y = Perceived Risk Aversion [Country = Netherlands]	0,9759 0,9392	0,2193 0,0027			1227	0,0000	-0,4533
3	x = Actual Risk Aversion [Country = Poland] y = Perceived Risk Aversion [Country = Poland]	0,9778 0,9782	0,1967 0,2068		0,2370			

Table 3: Actual vs. Perceived Risk

### 4.2.2. Poland vs. The Netherlands

Nationality is also compared on a global level before more detailed tests are conducted. In actual risk aversion, the Polish sample population is normally distributed; however, the Dutch sample population is not. Therefore, the Mann-Whitney U-test is used to uncover a significant difference between Polish and Dutch actual risk aversion at the 5% significance level. The effect size delta of 0.1287 indicates a small effect. On perceived risk aversion, both populations are normally distributed; hence the T-test is used. The P-value of 0.1109 falls just short of the 10% significance level and therefore fails to find a significant difference at that level.

National Risk Appetite		Shapiro-Wilk normality test		Two Sample T - Test		Mann-Whitney U-test		Effect
		W	P-value		P-value	W	P-value	Delta
1	x = Polish [Average] y = Dutch [Average]	Actual Risk	0,9782 0,9392	0,2068 0,0027		2002	0,0202	0,1287
2	x = Polish [Average] y = Dutch [Average]	Perceived Risk	0,9778 0,9759	0,1967 0,2193	0,1109			

Table 4: Poland vs. The Netherlands average

### **4.2.3. Gender Differences**

On an overall level for actual risk aversion, neither the male nor female sample is usually distributed. Therefore, the Mann-Whitney U-test is used, which fails to reject the null hypothesis with a P-value of 0.4935, concluding no significant difference between males and females in actual risk aversion, as shown in Appendix D. Contrary to actual risk, the perceived risk aversion tests were found to be normally distributed, their T-test resulting in a highly significant difference at the 1% level, as can be seen in test 1 in Table 4. The Cliff's Delta of 0.3211 signals an effect size on the higher end of the ‘small’ classification. Further tests will be concluded to uncover significant differences between males and females on a national level.

### **Gender Differences Between Countries**

When comparing females between Poland and The Netherlands, both samples and risk types are normally distributed. From the T-test, insignificant P-values of 0.2176 and 0.3462 were found, as can be seen in Appendix D. While the average does differ between the two, we cannot reject the null hypothesis because the P-values do not fall within the critical value range. Therefore, we have to conclude that there are no significant differences observed between Polish and Dutch females. The male tests were not normally distributed. Therefore, the Mann-Whitney U test is used for actual risk aversion, resulting in a P-value of 0.0663, as shown in Table 4 test 5. This indicates a significant difference at the 10% confidence level with an effect size of -0.2778. The perceived test consisted of two normally distributed variables. The following T-test resulted in an equally insignificant P-value of 0.7440, as shown in Appendix D. Therefore, there is significant evidence of a difference between actual risk aversion in Polish and Dutch males; however, the groups identically perceive risk.

### **Gender Differences Within Countries**

All gender variables tested within countries are normally distributed amongst actual and perceived risk. Therefore, T-tests are used. In actual risk aversion, a significant difference at the 5% level is found between Polish males and females, carrying a small effect size of 0.2716. The same test for perceived risk aversion returned an insignificant result, which is included in Appendix D. Therefore, we only find evidence of a difference between the actual risk aversion of Polish males and females. When comparing actual risk aversion for males and females in The Netherlands, a significant difference is found at the 5% confidence level. This difference

has an effect delta of -0.32, which classifies as a small effect, a similar result as found in the Polish sample. While not at the 5% level, we find a significant result at 10% when doing the same test for perceived risk aversion. This test also carried a comparable effect size of -0.29. Therefore, we can conclude that there is enough evidence to support differences between risk aversion in Dutch males and females.

	Gender and Risk Appetite - Significant Results	Shapiro-Wilk normality test		Two Sample T - Test		Mann-Whitney U-test		Effect Delta
		W	P-value	P-value	W	P-value		
1	x = Polish [Gender = Female] Dutch [Gender = Female]	Perceived Risk	0,9895	0,7407	0,0003256		0,3211	
	y = Polish [Gender = Male] Dutch [Gender = Male]		0,9760	0,2738				
2	x = Polish [Gender = Male] y = Polish [Gender = Female]	Actual Risk	0,9761 0,9629	0,6799 0,1577	0,0293		0,2716	
	y = Dutch [Gender = Female]							
3	x = Dutch [Gender = Male] y = Polish [Gender = Female]	Perceived Risk	0,9432 0,9706	0,1216 0,5787	0,0722		-0,2913	
	y = Dutch [Gender = Male]							
4	x = Dutch [Gender = Male] y = Dutch [Gender = Female]	Actual Risk	0,9252 0,9349	0,0414 0,0286	375	0,0251	-0,3203	
	y = Polish [Gender = Male]							
5	x = Polish [Gender = Male] y = Dutch [Gender = Male]	Actual Risk	0,9658 0,9307	0,5424 0,0263	325	0,0663	-0,2778	
	y = Dutch [Gender = Female]							

Table 5: Significant Gender Differences in Risk Aversion

#### 4.2.4. Age Differences

As can be seen from test 1 in Table 5, both the combined younger and colder samples are not normally distributed. Therefore, the Mann-Whitney U-test is used, through which a significant difference at the 10% level is found between the actual risk aversion of older and younger business students. The identical tests for perceived risk aversion returned an insignificant result. Since a significant difference is found between the actual risk aversion of younger and older students, a further assessment will be done on the effect of age at a national level.

Figure 7 below visualizes the opposing development of risk appetite between Poland and The Netherlands. The large standard deviation of results further highlights that a larger sample would have yielded a more significant result in some categories. Overall, we find enough evidence to support that nationality affects how risk appetite develops with age.

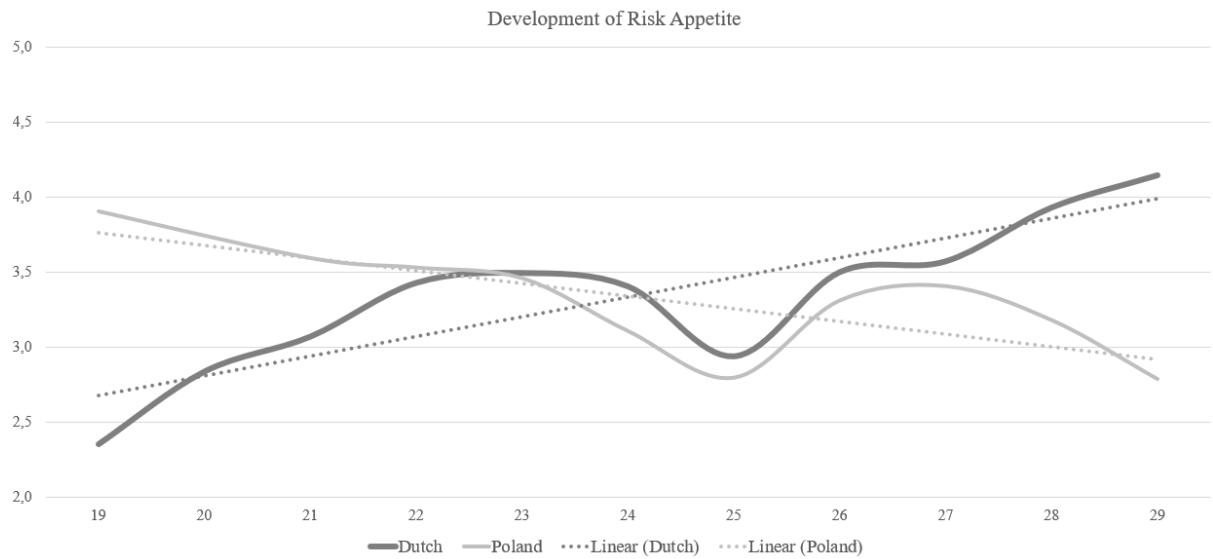


Figure 7: Development of Risk Appetite across ages and nations

## Age differences Between Countries

When comparing the older students from Poland and The Netherlands, the Mann-Whitney U-test is used because results are not normally distributed. An extremely low P-value of 0.0057 confirms a significant, medium-sized difference at the 1% level between older Polish and Dutch business students' actual risk aversion. The T-test results for perceived risk aversion resulted in an insignificant difference, which means that while their actual risk aversion differs, they perceive risk in the same way at an older age. The insignificant test is included in Appendix D. Contrary to the older sample; both the actual and perceived young Polish and Dutch samples are normally distributed. No significant difference is found between the actual risk appetite of young Polish and Dutch students. A highly significant difference is found at the 1% level between the way young Polish and Dutch students perceive risk. The delta estimate of 0.359 reveals a robust medium effect size, visualized in test 3 in Table 5.

## Age Differences Within Countries

When comparing older and younger polish students, it is known from previous tests that all variables in this category are normally distributed. From the T-test, it becomes clear that on both actual and perceived risk aversion, there is a significant difference found at the 5% level, with an identical delta effect size of 0.34 for active and 0.30 for passive. Therefore, there is a clear difference between how younger and older Polish students perceive and behave regarding risky situations. A stark contrast is found when performing the same comparison amongst younger and older Dutch students. The test for actual and perceived risk included in Appendix D. resulted in highly insignificant differences. Therefore, there is no evidence that older and younger Dutch students differ in their actual and perceived risk behavior.

Age and Risk Appetite - Significant Results		Shapiro-Wilk normality test		Two Sample T - Test		Mann-Whitney U-test		Effect
		W	P-value		P-value	W	P-value	Delta
1	x = Polish [Age <= 23]	Actual Risk	0,9557	0,0111		3011	0,0912	0,1625
	Dutch [Age <= 23]		0,9697	0,0881				
2	x = Polish [Age > 23]	Actual Risk	0,9734	0,4893		374	0,0057	-0,3848
	y = Dutch [Age > 23]		0,9166	0,0168				
3	x = Polish [Age <= 23]	Perceived Risk	0,9727	0,4522	0,0027			0,3590
	y = Dutch [Age <= 23]		0,9676	0,3798				
4	x = Polish [Age <= 23]	Actual Risk	0,9624	0,2134	0,0131			0,3401
	y = Polish [Age > 23]		0,9734	0,4893				
5	x = Polish [Age <= 23]	Perceived Risk	0,9727	0,4522	0,0139			0,3043
	y = Polish [Age > 23]		0,9479	0,0759				

Table 6: Significant Age Differences in Risk Aversion

### 4.2.5. Educational Differences

Initially, it was tested whether there is a difference in risk appetite between Bachelor and Master students. Since not both actual risk samples are normally distributed, the Mann-Whitney U-test is used. A P-value of 0.8093 signified robust evidence that there is no difference between the actual risk aversion of Bachelor and Master students. Identical results were found for the perceived risk aversion, with a p-value of 0.5815, as shown in Appendix D. In order to completely rule out the effect of educational differences on a sample population, the demographic will be further evaluated on a national level.

## Educational Differences Between Countries

When Bachelor students are compared between the two countries, highly insignificant results are found. Therefore, there is no difference in the actual risk aversion of Polish and Dutch Bachelor students. For perceived risk aversion, a significant difference at the 10% level is found with a small effect size of 0.23. Therefore, there is a small difference in how Polish and Dutch Bachelor students perceive risk. In complete contrast to the Bachelor results, there is a very significant difference found between the actual risk appetite of Polish and Dutch Master students. The difference has an effect size of -0.42, which classifies as a robust medium effect. However, there is no significant evidence of a difference between Bachelor and Master students on perceived risk aversion. Therefore, while Bachelor's students from either country have a similar actual risk appetite but perceive it differently, Master's students have a different actual risk appetite but similar perception.

## Educational Differences Within Countries

When comparing the actual risk appetite of Bachelor and Master students within The Netherlands, a significant difference at the 10% level is found. With a delta of -0.26, this signifies a slight difference. The same comparison for perceived risk aversion returned an insignificant test result, as observable in Appendix D. Therefore, Bachelor and Master students similarly perceive risk. However, they act differently in a risky scenario. Again, the Polish sample behaved in the exact opposite way. On actual risk aversion, with a P-value of 0.42, there is no significant difference found between Bachelor and Master students. Meanwhile, perceived risk aversion shows a significant difference at the 5% level. This signifies that there is a small effect size between how Polish Bachelor and Master students perceive risk.

Education and Risk Appetite - Significant Results	Shapiro-Wilk normality test		Two Sample T - Test		Mann-Whitney U-test		Effect Delta
	W	P-value	P-value		W	P-value	
1    x = Polish [Education = Bachelor] y = Dutch [Education = Bachelor]	Perceived Risk	0,9701 0,9757	0,4116 0,5482	0,0685			0,2349
2    x = Polish [Education = Master] y = Dutch [Education = Master]	Actual Risk	0,9612 0,9203	0,1834 0,0353		327	0,0036	-0,4161
3    x = Dutch [Education = Bachelor] y = Dutch [Education = Master]	Actual Risk	0,9190 0,9203	0,0081 0,0353		407	0,0755	-0,2555
4    x = Polish [Education = Bachelor] y = Polish [Education = Master]	Perceived Risk	0,9727 0,9479	0,4522 0,0759	0,0139			0,3043

Table 7: Significant Educational Differences in Risk Aversion

## **Conclusion of Results**

The first comparison made was between the overall difference of actual and perceived risk since this comparison will later be performed on all other subtests. Results showed a highly significant difference between the way people perceive risk and how they actually act around risk on an overall level and a national level in The Netherlands. This result could not be identified for the Polish sample; however, enough evidence was produced to further analyze the differences on a more detailed level. Before analyzing the demographic factors, the level of risk aversion was compared between the Polish and Dutch populations as a whole. This test showed that there is a significant difference in risk appetite. The difference is visible when comparing the actual risk aversion and can also be seen in a perceived risk aversion test.

Even though differences were observed during the mean comparison of genders in the descriptive statistics, none of the three tests performed returned significant results. Both on a total level and the national levels, there are no observable differences in the actual risk appetite of men and women. However, in contrast to actual risk aversion, the results of perceived risk aversion showed some highly significant differences in how men and women perceive risk. In addition to this, more significant differences in the actual and perceived risk aversion of men and women were found when comparing men and women within one country and comparing either sex with its foreign counterpart.

A significant difference was found when comparing the actual risk aversion of the combined younger and older students. This difference was confirmed once more when further analyzing the differences in actual risk aversion between the older sample population from Poland vs. The Netherlands. Here it can be observed that there is a difference between the two nations that is significant even at the 1% level. However, the actual risk appetite of young Dutch and Polish students was proven to be identical. The comparison amongst perceived risk aversion turned out insignificant at an overall level. Yet, significant differences were found when comparing younger and older students within both countries.

On the education demographic, the overall tests for both actual and perceived risk initially revealed a substantial lack of evidence to support a difference between Bachelor and Master students. When investigated further, the same was concluded when comparing Polish and Dutch Bachelor students. However, on the Master's level, a very significant difference in actual

risk appetite is observed between Dutch and Polish students. For perceived risk aversion, significant differences were found only when comparing Bachelor students from both countries. Considering that Master's students are generally older than Bachelor students and therefore have a higher chance of falling in the older age group, the significant differences in risk preferences between the older sample population and Master students can be linked.

The questions related to how risk is portrayed as “gains” and “losses” show that when being faced with a situation involving a “gain,” respondents are seen as risk-averse. However, when faced with a situation involving a “loss,” respondents are seen as risk-takers and opt for the neutral or riskiest options. This finding is shared amongst Poland and The Netherlands. When asked about their association with the concept of risk, most respondents from both countries linked it with “uncertainty.” Similar associations occurred with the words “gain” and “loss.” Here, the association or risk with a “loss” was favored overall and on a country level.

Because an extensive amount of results were discussed in the past chapter, Figure 8 below is made to provide a systematic overview of the regressions in this paper.

# Overview of Regression Results

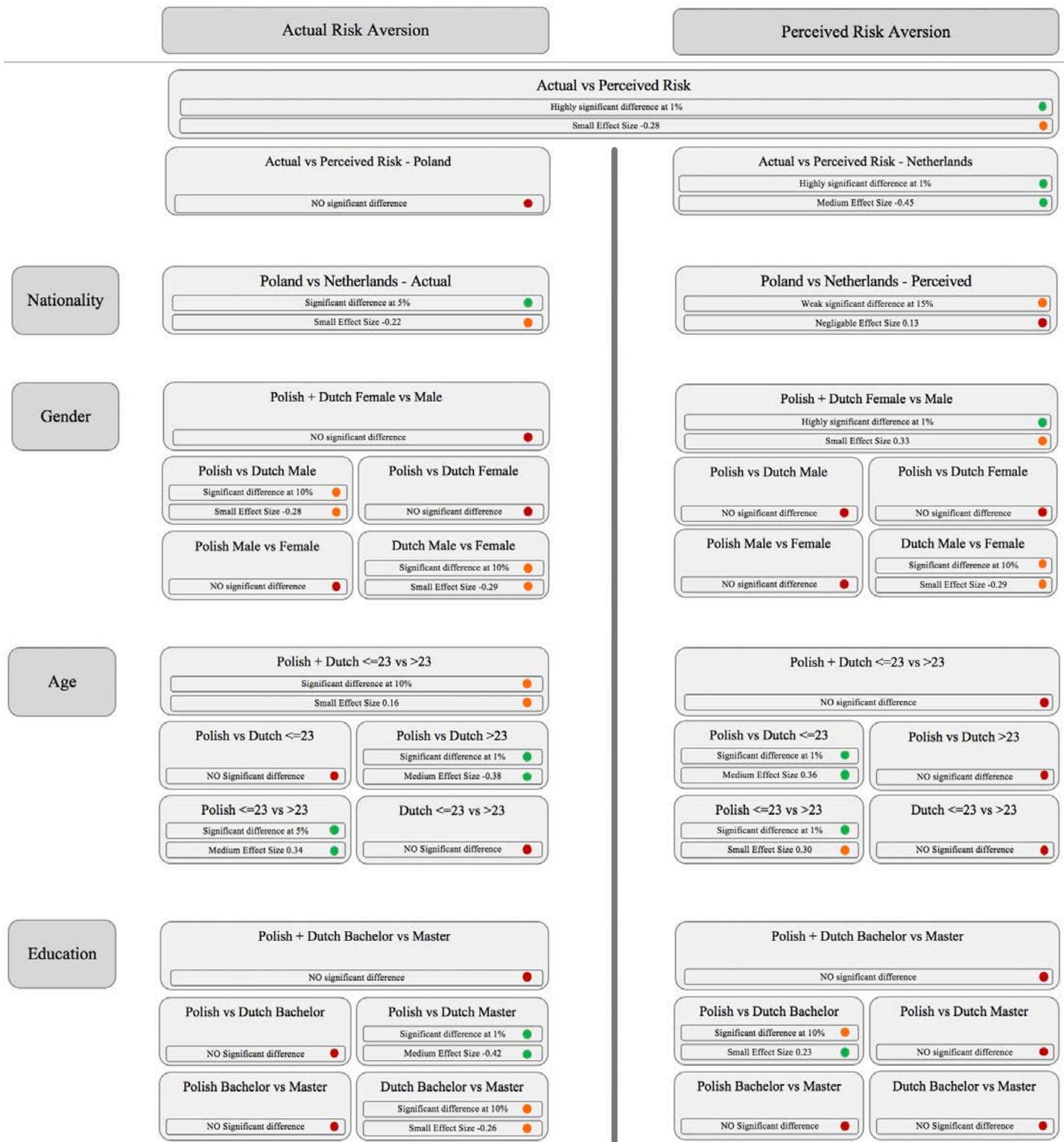


Figure 8: Overview of Regression Results

## **5. Discussion**

In this chapter, the results of empirical data analysis will be discussed, after which the conclusion is presented. The discussion, just like the results chapter, will follow the structure set by the hypotheses. First, the authors will reflect on the difference between perceived and actual risk since this is an underlying effect that will be discussed throughout all other tests. Hereafter, nationality's effect on the demographic factors at hand and their impact on risk appetite is discussed, followed by the gain/loss perception. Once the key findings have been summarized, the effect of demographics on risk appetite will be discussed in the context of strategic management. Finally, the authors will address the limitations of the study and identify opportunities for future research.

### **5.1. Perceived risk versus Actual risk**

The main focus of this paper was initially placed on actual risk appetite. However, the line between actual and perceived was often not visible in the literature, while the potential differences can be significant (Schoemaker, 2021). The importance of differentiating those two types of risk was further stressed by Sitkin and Pablo (1995), who argued that it could have implications on corporate management. Their study shows that the framing of problems and questions has a significant impact on risk perception, warning managers to be careful to frame an issue positively or negatively in relation to how they wish their subordinates to respond. Therefore, this chapter aims to briefly compare the differences found in this paper between actual and perceived risk aversion. The aim is to provide clear findings by answering H1 that contributes to the existing literature by stressing the (un)importance of perceived risk compared to actual risk.

The actual risk is the observed risk-taking which exposes an individuals' risk preferences by assessing their behaviors once the circumstance occurs, while the perceived risk is the intrinsic risk attitude (IRA) refers to people's behaviors towards risk ingrained at an early stage of life (Becker, 1990). When actual and perceived risk are tested at an overall level, a highly significant difference is found, while the effect size is small. The difference becomes apparent when performing the test at a national level. In Poland, we find no significant difference, while there is again a highly significant difference in the Dutch sample, now with a large effect size. Therefore, there is enough evidence to conclude that large and significant differences between

actual and perceived risk appetite exist. The real question is on which demographic factors perceived risk has an impact that differs from actual risk aversion.

When looking at nationalities, a negligible effect is found. This effect is very weak but would suggest that, while Poland and The Netherlands have a significant difference in their actual risk aversion, there is no real difference in how the countries perceive risk or deal with anchoring, bias, or framing problems. Hsee and Weber (1999) have found that culture plays an integral part in individuals' risk perception, with collectivist cultures estimating their level of risk aversion higher than it is while the individualistic cultures tend to think they are willing to take on more risk than they do. Poland places right between the individualistic and collectivist culture, with its population estimating that they are more risk-averse than they actually were. The findings for The Netherlands were confirmed as, as it is a highly individualistic country, the society perceives that they can take more risk than they are actually willing to. Moreover, Camerer et al. (1988) declared that attitude towards risk does not align with the actual riskiness of a person, which is also expressed in this paper.

To get more clarity, differences between perceived and actual risk amongst other demographics will be further compared. Contrary to actual risk, there is no overall difference in the perceived risk appetite of older and younger participants. However, a significant difference is found when comparing younger Polish and Dutch students. This difference is highly significant with a medium effect size. This can be linked to the findings of Pablo and Sitkin (1992), mentioned in the literature review, which stated that younger people are more susceptible to perceived risk aversion as they do not have much experience yet and are, therefore, not yet shaped by their surrounding factors such as culture/nationality. This is strengthened by the fact that there is no significant difference between older Polish and Dutch students' perceived risk aversion, as they would have gained more 'life experience' at this point. In line with the findings of actual risk aversion, there is also a significant difference between older and younger Polish students. This is particularly interesting since there is no sign of such difference amongst the Dutch sample, further strengthening the case that the effects of nationality on other demographic factors are more grounded than previously discussed.

The results of perceived risk in the field of gender strongly oppose the findings on actual risk aversion. While actual risk imposed no significant difference, there is a highly significant difference between how men and women perceive risk. This points towards the fact that, while men and women might have identical inherent levels of risk aversion, they might differ in the field of perceived risk, framing of problems, or anchoring biases. This is a significant finding concerning the impact on strategic management, which will be further elaborated on in the following chapter.

The final demographic to be discussed is education level. Most tests indicate no significant difference amongst samples, and the perceived effect of education is nearly identical to the findings on actual risk aversion. There is one expected significant difference with a small effect size between Polish and Dutch Bachelor students. This difference is interesting because, while it yet again shares its finding with the significant difference found between younger Polish and Dutch students, it opposes the insignificant difference this category of education showcased on actual risk aversion. As with age, younger, less educated participants are probably more susceptible to risk perception through their lack of life experience. This difference disappears when participants become Master level students, while a very significant difference was found on actual risk aversion amongst Polish and Dutch Master students. This indicates that with life experience, perceived risk aversion levels out amongst the two countries. In contrast, the actual risk aversion is developed differently, likely because of influences from the natural environment.

Overall, perceived risk aversion has proven to be significantly different from actual risk aversion. Depending on the demographic discussed, the effect of perceived risk aversion adapts. It becomes evident that certain groups are more susceptible to perceiving risk, and this is something companies should realize.

## **5.2. The impact of nationality on risk appetite**

In this chapter, the impact of nationality on risk appetite will be discussed. At the center of this chapter is the second hypothesis, which aims to uncover whether the nationality of business students impacts their level of risk appetite. The established anthropological theory depicts that in risky situations, people are guided by their cultural background (Ward and Zurbruegg, 2000). These backgrounds were found to differ per country (Gándelman and Hernández-Murillo, 2015). Concerning the sample in this paper, the regression analysis on the average actual Polish and Dutch Business students' risk appetite resulted in a very significant difference in risk preferences.

This confirms Gándelman and Hernández-Murillo's (2015) finding, who have stated that risk differs per country and observed that Poland is slightly less risk-averse than The Netherlands, which is also the case in this paper. The observation that demographics impact risk preferences are also in line with Hofstede and Minkov (2010); however, their research concludes that Poland is more risk-averse than The Netherlands, where this paper finds the opposite true. There are several reasons for this discrepancy. First of all, the data used by Hofstede dates back to the 1970s, which creates a gap of over 50 years. As we know from the literature review, existing literature has found significant gaps in generational risk appetite (Birkinshaw et al., 2019). Therefore, it is understandable that countries are either more or less risk-averse than they once were. In addition, Hofstede's research was much broader, taking an entire population into account, while this paper solely focused on business students. The difference in sample population will therefore also affect the average age studied, the impact of which will be discussed in the coming sections.

Alongside Hofstede and Minkov (2010), this result, therefore, opposes the view of Damodaran (2007). While the difference between The Netherlands and Poland is very significant, the effect size is relatively small. Yet, this is in line with the expected outcome of the results. When the authors were in the initial phases of the research, existing literature that supported the idea that nationality impacts risk appetite sketched an idea of what countries are more risk-averse than others. As the paper was limited by time and resources, the choice was made to investigate The Netherlands and Poland, knowing that these countries were not the two most extremes in existing results. Therefore, the small effect size is in line with the findings of Gándelman and Hernández-Murillo (2015), which was previously visualized in Figure 1. While Hofstede and Minkov (2010) highlighted larger differences between Poland and The Netherlands, it has been

mentioned before that there is a significant gap in the periods researched. Therefore, it is more reasonable to compare the results to Gándelman and Hernández-Murillo (2015). O'Connell (2013) revealed that cultures with high UAI are less comfortable with ambiguous situations and are more likely to follow the rules. On the contrary, countries with lower UAI feel more comfortable facing uncertainty and are more tolerant of change. Both countries' average being closer to "risk-averse" indicates that they are closer to having a higher UA. This means that both countries tend to be more patient in a business setting and take their time for discussions in an organization. Moreover, they can also be expected to reject risky proposals (O'Connell, 2013).

The initial finding of a significant difference in risk appetite regarding nationality sets the stage for the coming sections, where the effect of nationality on additional demographic characteristics will be discussed to strengthen findings even further.

### **5.2.1. The national impact of age on risk appetite**

This chapter aims to uncover what effect age has on risk appetite and whether there are any underlying differences based on nationality. To assess the aspect of age, the sample population was cut in half at the mean age. Hereafter, the younger group was compared to the older group. This approach is not as efficient as others that have been used in existing research. However, those researches were usually explicitly focused on the effect of age; therefore, their sample consisted of a broader age span. With the research sample being focused on students, only a limited scope of ages is available. Yet, the authors set out to uncover whether the effect of age can be significantly distinguished in such a small age range. Overall, when comparing the sample with both countries combined, a significant difference is found with a small effect size. This is in line with the findings of Hignite et al. (2002) and McKenna and Richardson (1995), who both found age to impact risk appetite. This paper shares their conclusion that the older people get, the more risk-averse they become.

This can be explained by the fact that when people get older, they go through major life events, thereby becoming more aware of the mortality and adapting their risk preferences accordingly (Birkinshaw et al., 2019). On the contrary, Konovsky et al. (1987) and Krumov et al. (1997) found that age does not impact risk aversion, which is not confirmed in this paper.

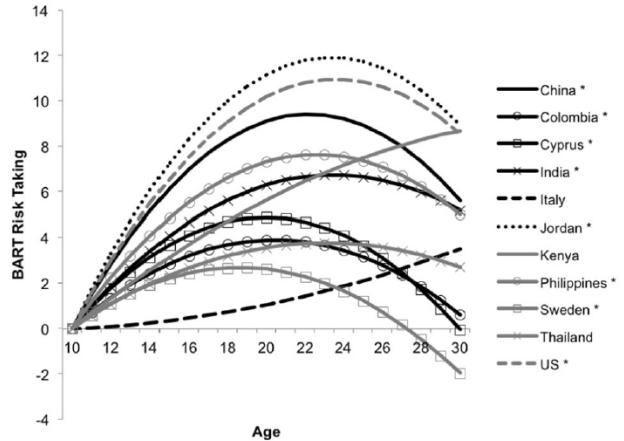


Figure 9: BART Risk-taking across ages and nations

However, more recently, Duell et al. (2017) researched the development of risk appetite across ages and nations. Their results are visualized in Figure 9. These results are significant because they are one of the first to highlight how the development of risk appetite can differ with nationality. Therefore, it would be too shortsighted to simply conclude that the results in this paper are in line with previous research. Most research makes a generalized conclusion about the effect of age. This paper's findings are in line with the opposing views of Duell et al. (2017), who concluded that nationality impacts age development of risk appetite. This paper found that in Poland, people take more risks with age. In The Netherlands, on the contrary, older people tend to take less risk; this inverse age development of risk appetite is visualized in figure 7 in the results chapter. The finding is the argument used to oppose the generalized conclusions by Hignite et al. (2002) and McKenna and Richardson (1995), which state that risk aversion increases with age.

The tests from the other two groups confirm the findings of Duell et al. (2017); risk appetite develops differently across nations. Overall, the level of risk aversion is found to increase with time; yet we find that the development is different between the Polish and Dutch populations. Duell et al. (2017) know that the decline in risk appetite starts at different points for different countries. This builds on the findings of Hignite et al. (2002) that children are more likely to take risks. The level of risk appetite will rise towards a peak level during one's youth, after which it decreases as the individual gets older. By combining Hignite et al. (2002) and Duell et al. (2017) findings, it becomes apparent that some countries will reach their peak in risk appetite earlier than others. Figure 9 gives a clear image hereof that also highlights a shortcoming to this paper. Duell et al. (2017) investigated an age range from 10 till 30; this paper only reflects on half of the timespan.

### **5.2.2. The national impact of gender on risk appetite**

Results showed that overall, gender does not have a significant impact on actual risk appetite. However, looking more closely at the results, it can be seen that when it comes to the Dutch sample, females are less risk-averse than males. On the contrary, looking at the Polish sample, females are more risk-averse than men. When comparing the same gender, it can be seen that Polish females are less risk-averse than Dutch females and Polish males are more risk-averse than Dutch males. The findings of Slovic (1966) and Hignite et al. (2002), who have found significant differences in risk aversion between genders, were not confirmed in this paper.

Moreover, the most common statement in the literature regarding gender risk preferences is that women are more risk-averse than men. This statement is not applicable in the scenario depicted in this paper, whereas the risk aversion is dependent on the country to which the individual belongs. It is evident in Poland, where it is men who appear to be more risk-averse. Croson and Gneezy (2009) found that male and female business professionals have the same level of risk aversion are partially confirmed. The result of this study is that there are no significant differences between the genders and future business leaders represent the sample. It is also in line with Eagly and Johnson (1990) and Korabik et al. (1993), who concluded that men and women who share an equal position mostly behave in the same way. As the sample population was business students, they are in a relatively similar position, and therefore, the differences between men and females might not be so significant. Since males and females are equally risk-averse, risk appetite is not a reason why there are fewer women in management than men (Eagly and Johnson, 1990).

Perceived risk aversion, on the other hand, indicates highly significant differences between males and females. This difference is overall, and there is no difference between the countries. This points towards the conclusion that males and females have different sensitivities towards the framing of risky situations. Therefore, it is depicted that gender mainly affects perceived risk aversion; however, it is not affected by nationality. This cannot be applied to Dutch males, as their actual risk aversion differs from the rest of the sample; therefore, the correlation between actual and perceived risk aversion differs.

### **5.2.3. The national impact of education on risk appetite**

Since companies employ people from various educational backgrounds, it is relevant to understand how education affects risk appetite. Previous literature has found differences in the level of risk aversion across education levels (Hartog et al., 2002; Guiso and Paiella, 2008; Shaw, 1996). The method of measuring education in this paper is comparable to Hartog et al. (2002), who measured education by the number of years studied. Yet, the analysis showed that overall, there is no significant difference in risk appetite between Bachelor's and Master's students. There are, however, differences at a national level. A highly significant difference was found when comparing Polish and Dutch Master students. When making a similar comparison on Bachelor level, however, no significant difference was found. From the literature review, we know that education levels are linked to age, as Bachelor's students are generally younger than Master's students. It is, therefore, no surprise that the significant difference between Polish and Dutch Master's students can be linked to the equally significant difference found when comparing Polish and Dutch participants over the age of 23. This strengthens the reliability of the results. In addition, there is a slight difference between Dutch Bachelor and Master students. In the age chapter, it was already highlighted that most of the sample was Polish and that the possibility exists that certain ages are underrepresented in The Netherlands. Since we know that age and education are linked, this weakly significant finding might indicate that there is a difference between younger / older or Bachelor / Master students in The Netherlands, but the sample was not extensive enough to capture it.

Yet, while most education results are insignificant, these results could be the most interesting after all. Since the Polish and Dutch Bachelor comparison yielded an insignificant result, we observe that the levels of actual risk aversion are similar at this education level. This is again backed up by the insignificant result when comparing Dutch and Polish participants aged equal to or younger than 23. However, since we have a highly significant difference at the Master's level, we have evidence to believe that external factors such as environment/culture have an impact on the development of risk appetite over the years.

### **5.3. Gain and Loss perception**

The purpose of the study was also to find out more about gain and loss perception and the relevance of prospect theory described in 1979 by Kahneman and Tversky. The finding of prospect theory was that when faced with prospects involving gain, individuals will be seen as risk-averse; however, they will be seen as risk-takers when faced with prospects involving losses. As shown in Figure 4 in the Results section, this finding is confirmed by the study conducted in this paper. Looking at Figure 4 can be seen that, when it comes to the question where individuals were faced with prospects involving gains, the majority chose the least risky option, which makes them appear risk-averse. However, when asked a similar question but with loss prospects, more respondents are inclined to select the neutral or even riskiest option; therefore, they are seen as seeking risk. Those results confirmed the prospect theory on an overall sample level and at an individual national level. They also confirm that people make decisions in relation to reference points rather than assets they possess (Kahneman and Tversky, 1979). One of the explanations why Polish and Dutch nationals opt for the safer option when faced with gains and opt for riskier options when reflecting on losses is that people usually are far more irritated when confronted with a loss than happy when they win exactly the same amount (Charness and Rabin, 2002). This further enhances the statement that they favor a particular reference point than any other alternative and appreciate current belongings over things they do not possess (Thaler, 1980).

In addition, the risk associations with unfavorable outcomes (Smith, 1776) were also confirmed in this study as participants more often opted for associating the word risk with “uncertainty” rather than “opportunity” and with “loss” rather than “gain.” This can also partially confirm the findings of Camerer et al. (1988) and Yates and Stone (1992), whereas managers are found to perceive risk as a possibility of loss as in this case, students are seen as the future managers, and they also seem to perceive it that way.

## **5.4. Impact on Strategic Management**

Understanding how people within organizations take risks is essential for strategic management. It helps define what actions can be expected with regards to identifying, managing, and mitigating risks along the way. The organization and its employees should be aware of risks, even though they can never predict them with full certainty. As a result, knowing how individual initiatives affect a company's overall strategy will give decision-makers the resources they need to prioritize risk reduction strategies for those individual initiatives.

Looking at the results from the previous section, it can be concluded that risk appetite will differ across nationalities. Looking at the sample of Polish and Dutch business students, it can be stated that even though there are cross-national differences in risk appetite, they are relatively small. On the other hand, when faced with decisions related to uncertainty, both Polish and Dutch nationals will behave in a relatively similar manner. In addition, both of the countries' averages are balanced on a risk-taker – risk-averse scale, being a bit more closely to the latter. Based on this, it can be stated that none of the business students from those countries will be prone to taking high risks in organizations while at the same time they will not run away from situations that involve uncertainty.

Given that the countries are closer to a risk-averse scale, those individuals might be slower to take decisions in a professional setting, as they may not feel comfortable with the ambiguity of certain projects, constantly trying to account for risk (O'Connell, 2013). It can also be expected that they will be more likely to follow the rules and take time for discussions in order to control the uncertainty they are being faced with, rather than work dynamically and implement all ideas quickly (O'Connell, 2013). This behavior can be seen more clearly in an older population or Master's students, especially Dutch ones, as they seem to become more risk-averse with age. However, even though there were differences in their risk appetite compared to younger peers, those differences were not significant enough to significantly impact decision-making. This paper confirmed that males and females in the business world behave in a relatively similar manner. Therefore, it can be expected that, when it comes to being faced with risk and uncertainty in an organization, there is no difference whether a woman or a man will handle the situation, as there is no difference in how men and women act upon risk. On the other side, having a balanced workforce can help the company better understand risks while acting upon them, as there is a difference in how men and women perceive risk.

## **6. Conclusion**

The purpose of this research paper was to investigate whether risk appetite, consisting of perceived and actual risk, differs amongst demographics and how this impacts strategic management. 186 Polish and Dutch business students have participated in a survey. The results were further analyzed and led to the following conclusions.

The nationality was the foremost crucial demographic aspect analyzed, which served as a base for determining whether other demographics can impact risk appetite. A significant difference in risk appetite was found between the Polish and Dutch samples. Therefore, we find that nationality can have an impact on risk appetite. This laid the foundation of the analysis of the three other demographic factors. This paper did not only check whether these factors have an impact on risk appetite but also whether there is an impact independently within and between the countries so that this impact can be linked to the effect of nationality.

When it comes to age, there was a significant difference when comparing the age differences in risk appetite in Poland and The Netherlands, yet age was found to have a small effect on the risk appetite. The prior literature finding that the older people get, the more risk-averse they become was confirmed in this paper. However, previous findings look at age as a whole, and in this paper, it was a variable dependent on nationality.

The literature on the effect of gender often focuses on combining multiple countries in one study rather than providing a comparison between distinct nations. Further, small populations have also been disregarded in prior research. Therefore, those results were expected to be highly generalized. This paper finds no cross-national significant difference between the gender effect in Poland and The Netherlands. This is justified by the subtests, which depict that both genders develop uniquely based on their nationality. Even though there are significant differences between genders within the countries, these differences do not appear when comparing the two nations. This means that while the effect of gender on risk appetite can be confirmed, there is no impact by the nationality factor.

Finally, the level of education was analyzed for cross-national differences. No significant difference in actual risk aversion was found between the Polish and Dutch students at the Bachelor's level. This finding is backed up by the insignificant difference when comparing Dutch and Polish participants younger than 23. However, since there is a highly significant difference at the Master's level, the evidence to believe that external factors such as environment/culture have an impact on the development of risk appetite over the years exists. Therefore, it can be concluded that the level of education amongst different nationalities impacts risk appetite.

Based on these factors, the paper's main finding is that demographics impact individuals' risk appetite. Moreover, the regression analysis between Dutch and Polish business students confirmed a significant difference with regards to people from the aforementioned countries at the 1% confidence level. Ergo, the H1 can be accepted because Dutch and Polish business students' risk appetite is distinguishable. While significant, the difference between Poland and The Netherlands is small, which is in line with the expected outcome. The result confirms the findings of scholars such as Hofstede and Minkov (2010) and Gándelman and Hernández-Murillo (2015), who found that nationality impacts risk aversion. However, in Hofstede and Minkov's (2010) paper, Poland was seen as more risk-averse than The Netherlands, which is opposite to the Gándelman and Hernández-Murillo (2015) findings and the results depicted in this paper since the Polish sample was found to have a higher tendency to take risks. The contradiction is acceptable due to the generational gap between points of data collection.

Existing literature does not often differentiate between perceived and actual risk aversion. This paper found that the two types do not go hand in hand. The disparity was found to be highly significant, strengthening the importance of this differentiation.

Amongst the demographic factors, significant differences were found between perceived and actual risk. The age factor is an example hereof. With a medium effect size, it was found that younger people are more susceptible to perceived risk, as was also concluded in existing literature (Sitkin and Pablo, 1995). The effect of nationality on the age factor is strong since there is a significant difference between older and younger students in Poland but not in The Netherlands. In the field of gender, the results of perceived risk strongly oppose actual risk aversion, as there is a significant difference in how genders perceive risk. Lastly, the perceived effect of education is nearly identical to the findings made on actual risk aversion. To conclude, perceived risk aversion has proven to be significantly different from actual risk aversion. This leads to a statement whereas perceived risk aversion and actual risk aversion are distinguishable, thus accepting  $H_2$ .

The prospect theory has helped to understand the choices that individuals make for years. Both Polish and Dutch business students are sensitive to “framing.” When faced with a gain, they are more risk-averse, but they are risk-seeking when faced with a loss. This is especially relevant to managers as the actions of their employees when faced with ambiguous situations might differ dependent on the framing of the problem. Moreover, it is found that business students think of risk in terms of losses rather than gains. As taking risks is a big part of management, it is essential to make employees comfortable around uncertain decision-making so that risk and losses can be adequately managed (Chattopadhyay et al., 2001).

This paper focused on business students as they are the so-called “leaders of tomorrow.” Therefore, it is crucial to understand the potential implications of demographics on risk appetite in the context of strategic management. The results in this paper indicate the difference in actual and perceived risk appetite amongst Dutch and Polish students. While the difference between the two countries was relatively small, as expected, differences between other countries likely exist. Consequently, companies must realize the potential pitfall of a homogeneous employee pool. In addition, the significant differences found in perceived risk aversion highlight how important it is for companies to train their staff about the effects of framing. Regardless of the company's risk profile, the authors suggest that it will always be beneficial to create a work environment with people from diverse backgrounds that encompass a balanced split regarding gender and age.

The findings of this paper successfully contribute to the existing literature by providing clarity on the opposing views of Hofstede and Damodaran. The paper supports Hofstede's conclusion that demographics influence risk appetite amongst countries, in addition to the importance of the difference between actual and perceived risk, as previously described by Sitkin and Pablo (1995) and Kahneman and Tversky (1979). However, besides providing clarity regarding differences in the existing literature, this paper primarily explains a possible cause of those differences. Most literature sought to provide conclusions that can be generalized on a broad level. However, from the specific sub-tests done in this paper, it can be concluded that differences in risk appetite in the field of age, gender, and education differ amongst countries and should therefore not be generalizable, which would explain the opposing views in the existing literature.

The main research question of this paper is **How do demographics impact risk appetite amongst Polish and Dutch business students in the context of strategic management?** The results have shown that demographics play a significant role in the risk appetite of individuals, both – at a national and international level. The way people make decisions, especially when faced with uncertainty and risk, is shaped by different factors. In a continuously changing world the factors influencing risk appetite will also continue to evolve. Through the highly significant differences found, this paper highlighted the importance of nationality by shaping the risk appetite of Polish and Dutch business students amongst various demographics.

## **6.1.Limitations**

There are few notable research limitations in this paper which will be further described in the upcoming lines:

- Referencing and citing previous research studies represented the foundation of the literature review for this study. Simultaneously, those previous studies constitute the theoretical framework for the research question that has been investigated. However, there was a limited number of prior research studies on culture and its impact on risk appetite, particularly with regards to business students and in the context of strategic management. On one side, it is a strength as it is motivating the importance of this research, though it is difficult to refer to prior findings which represents a limitation. Further, there were very few studies that compared any demographical characteristics and their impact on risk appetite when discussing differences between Dutch and Polish individuals.
- The time available to study this research topic was constrained by the deadline of this dissertation. Consequently, the amount of data that was collected for the purpose of this analysis was limited by the time constraints.

The limitation of lack of previous research studies on the topic addressed in this paper represents an important opportunity for further development in this area of study. Considering the time constraints limitation, for future research, we call for repeating the same study on a larger sample to see whether the results presented in this paper would change in any way. For future research we call for a longitudinal study, as it could provide valuable information about how risk aversion develops once the sample grows older, rather than comparing age differences within the same sample. Moreover, it would be beneficial to conduct a similar study with more countries taken into account.

## 7. References

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## 8. Appendices

### APPENDIX A

#### Survey Questions

1. People who know me would describe me as a cautious person. \*

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

2. I feel comfortable about investing in the stock market. \*

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

3. I generally look for safe investments, even if that means lower returns. \*

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

4. I associate the word 'risk' with the idea of 'opportunity'. \*

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

5. I am willing to take substantial financial risk to earn substantial returns. \*

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

6. I am comfortable with taking risky decisions. \*

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

7. Suppose you can win a bonus from a gambling game through one of the following \*  
alternative winning ways, which one you would like to choose?

- Win €1,000 directly
- 50% chance of winning €2,000 and 50% of winning no money
- 5% chance of winning €20,000 and 95% of winning no money

8. Suppose you will lose some money from a gambling game through one of the  
following alternative ways, which one you would like to choose? \*

- Lose €1,000 directly
- 50% chance of losing €2,000 and 50% of losing nothing
- 5% chance of losing €20,000 and 95% of losing nothing

9. Imagine you are faced with 2 different investment opportunities. Make a choice \*  
between the estimates:

- 50% chances of gaining €1 million and 50% chances of gaining €3 million
- 50% chances of losing €1 million and 50% chances of gaining €5 million
- No preference

10. Which of the lucky draw tickets would you prefer over another? \*

- 15% chance of winning nothing, 35% chance of winning €1,000; 35% chance of win...
- 50% chance of winning nothing, 50% chance of winning €3000
- No preference

11. Imagine you are playing the lottery. Which of the following 2 alternatives would you \*  
\*

- 4% probability of winning €400
- 2% probability of winning €800
- No preference

12. You can either certainly receive €50 or toss a coin and win either nothing or €100 \* euro. What do you choose?

- €50
- Toss a coin with 50% chances of winning nothing and 50% chances of winning €100
- No preference

13. Do you tend to take risk without thinking of consequences? \*

- Yes
- No
- Sometimes

14. What comes to your mind when you hear the word „risk”? \*

- Uncertainty
- Gain
- Opportunity
- Loss
- Inna odpowiedź...

15. Would you identify yourself as a \*

1      2      3      4      5

Risk taker                                    Risk avoider

Po sekcji 1 Przejdź do następnej sekcji ▼

### Sekcja 2 z 2

## Personal questions

⋮

Opis (opcjonalnie)

Age \*

Tekst krótkiej odpowiedzi

Gender \*

- Female
- Male
- Prefer not to say
- Inna odpowiedź...

Nationality \*

- Polish
- Dutch

I am a \*

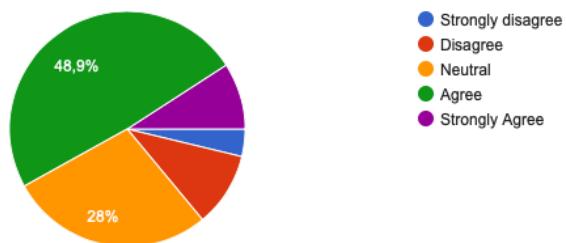
- Bachelor business student
- Master business student

## APPENDIX B

### Google Forms Survey Results

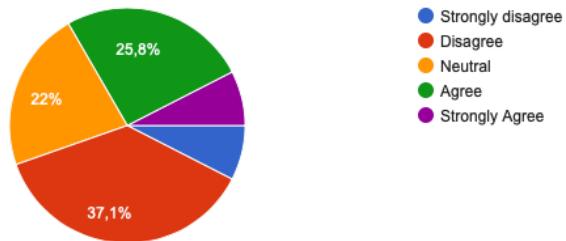
1. People who know me would describe me as a cautious person.

186 odpowiedzi



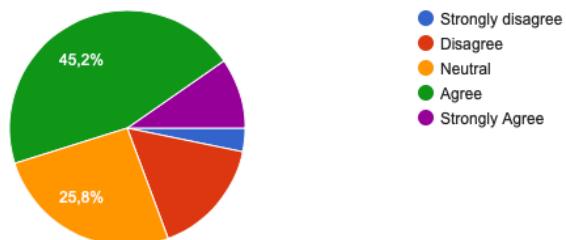
2. I feel comfortable about investing in the stock market.

186 odpowiedzi



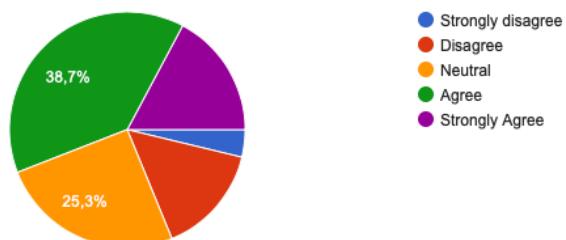
3. I generally look for safe investments, even if that means lower returns.

186 odpowiedzi



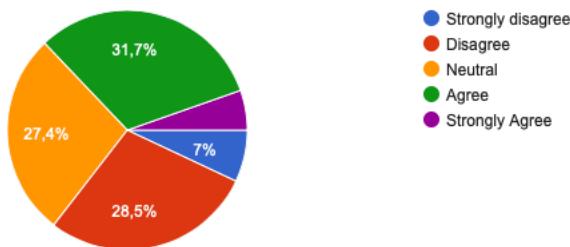
4. I associate the word 'risk' with the idea of 'opportunity'.

186 odpowiedzi



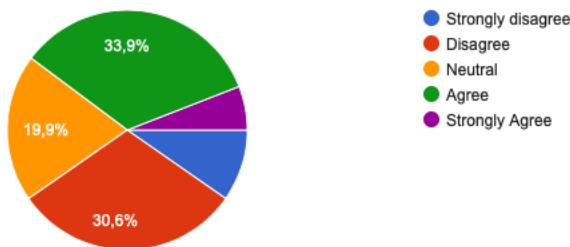
5. I am willing to take substantial financial risk to earn substantial returns.

186 odpowiedzi



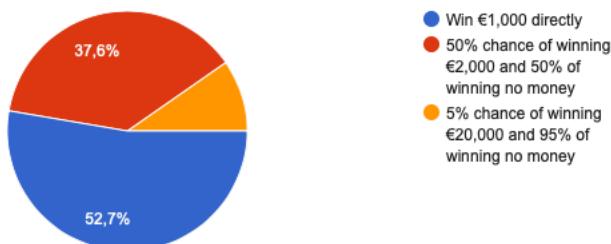
6. I am comfortable with taking risky decisions.

186 odpowiedzi



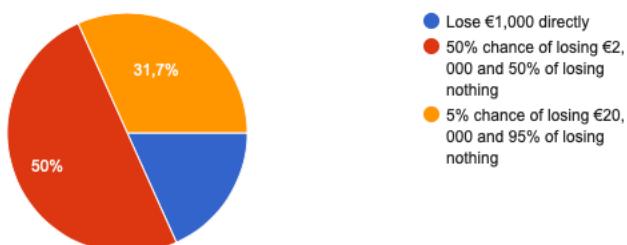
7. Suppose you can win a bonus from a gambling game through one of the following alternative winning ways, which one you would like to choose?

186 odpowiedzi



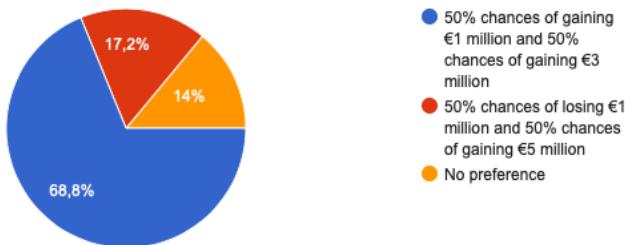
8. Suppose you will lose some money from a gambling game through one of the following alternative ways, which one you would like to choose?

186 odpowiedzi



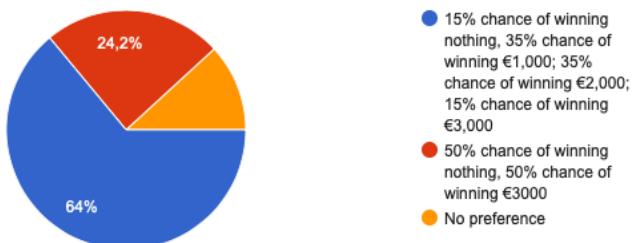
9. Imagine you are faced with 2 different investment opportunities. Make a choice between the estimates:

186 odpowiedzi



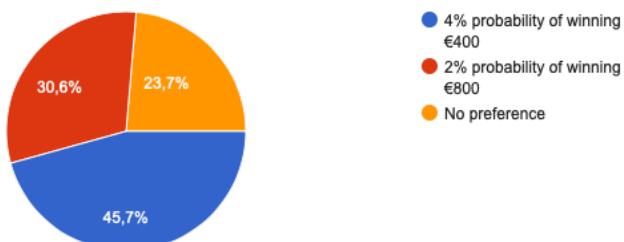
10. Which of the lucky draw tickets would you prefer over another?

186 odpowiedzi



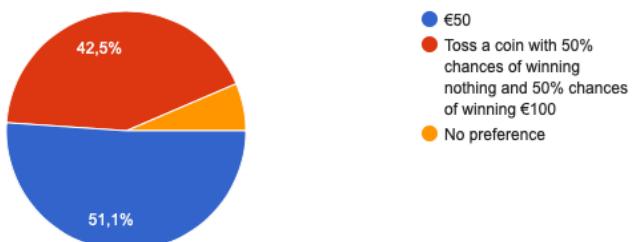
11. Imagine you are playing the lottery. Which of the following 2 alternatives would you prefer?

186 odpowiedzi



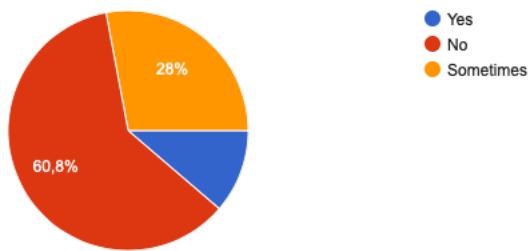
12. You can either certainly receive €50 or toss a coin and win either nothing or €100 euro. What do you choose?

186 odpowiedzi



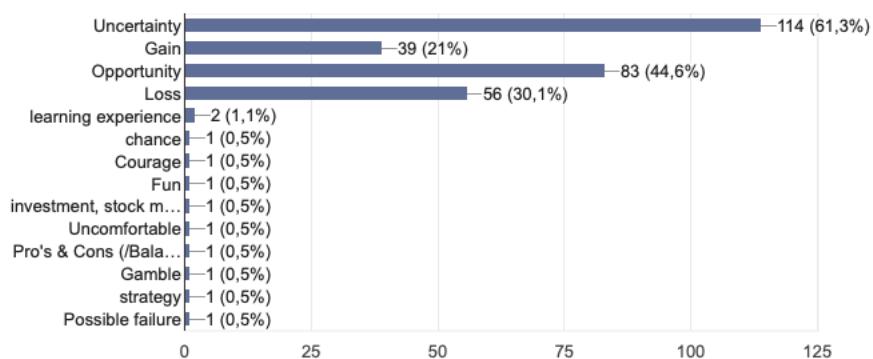
13. Do you tend to take risk without thinking of consequences?

186 odpowiedzi



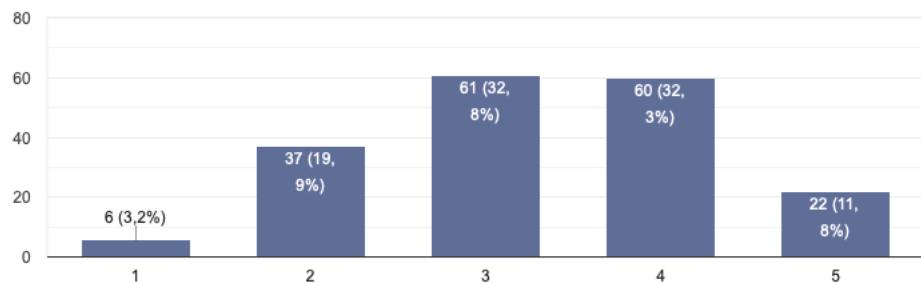
14. What comes to your mind when you hear the word „risk”?

186 odpowiedzi



15. Would you identify yourself as a

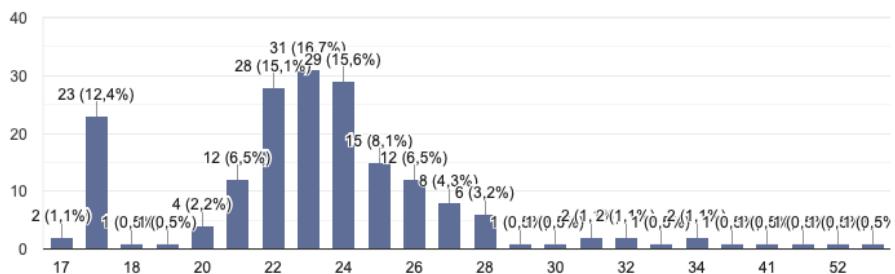
186 odpowiedzi



### Personal questions

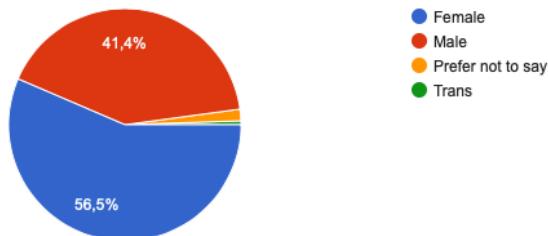
#### Age

186 odpowiedzi



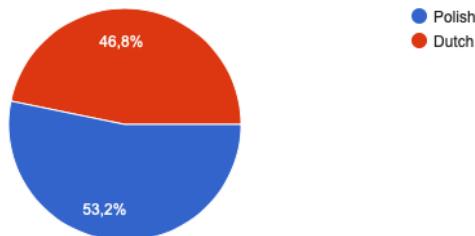
#### Gender

186 odpowiedzi



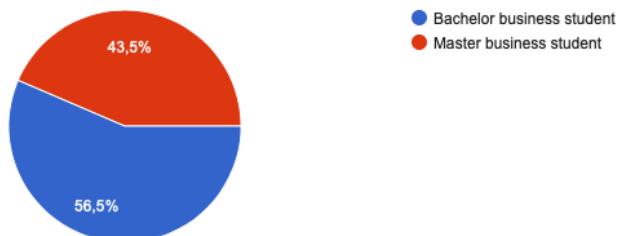
#### Nationality

186 odpowiedzi



#### I am a

186 odpowiedzi



## APPENDIX C

### Original Sample Descriptive Statistics

	Demographics		
	Total	The Netherlands	Poland
<b>Gender</b>			
Total	186	87	98
Male	77	49	28
Female	105	37	68
Other	4	1	2
<b>Age</b>			
Min	17	17	17
Max	69	42	69
Average	24	23	25
Median	23	23	23
<b>Education</b>			
Bachelor	56%	64%	50%
Master	44%	36%	50%

## APPENDIX D

### Insignificant Results

Gender and Risk Appetite - Insignificant Results			Shapiro-Wilk normality test		Two Sample T - Test		Mann-Whitney U-test	
			W	P-value	P-value		W	P-value
1	x = Polish [Gender = Female]	Actual Risk	0,9693	0,0442		2362,5	0,4935	
	Dutch [Gender = Female]		0,9557	0,0273				
2	x = Polish [Gender = Male] y = Dutch [Gender = Male]	Perceived Risk	0,9407 0,9624	0,1534 0,2541	0,7440			
3	x = Polish [Gender = Female] y = Dutch [Gender = Female]	Actual Risk	0,9725 0,9392	0,2690 0,0785	0,2176			
4	x = Polish [Gender = Female] y = Dutch [Gender = Female]	Perceived Risk	0,9802 0,9641	0,5339 0,3726	0,3462			
5	y = Polish [Gender = Male] x = Polish [Gender = Female]	Perceived Risk	0,9778 0,9768	0,7347 0,4951	0,1908			

Age and Risk Appetite - Insignificant Results			Shapiro-Wilk normality test		Two Sample T - Test		Mann-Whitney U-test	
			W	P-value	P-value		W	P-value
1	x = Polish [Age <= 23] Dutch [Age <= 23]	Perceived Risk	0,9831	0,4254		0,3416		
	y = Polish [Age > 23] Dutch [Age > 23]		0,9788	0,2796				
2	x = Polish [Age > 23] y = Dutch [Age > 23]	Perceived Risk	0,9479 0,9600	0,0759 0,2744	0,6869			
3	x = Polish [Age <= 23] y = Dutch [Age <= 23]	Actual Risk	0,9624 0,9391	0,2134 0,0524	0,7601			
4	x = Dutch [Age <= 23] y = Dutch [Age > 23]	Perceived Risk	0,9776 0,9600	0,3798 0,2744	0,3984			
5	x = Dutch [Age <= 23] y = Dutch [Age > 23]	Actual Risk	0,9391 0,9166	0,0524 0,0168		554	0,9446	

Education and Risk Appetite - Insignificant Results			Shapiro-Wilk normality test		Two Sample T - Test		Mann-Whitney U-test	
			W	P-value	P-value		W	P-value
1	x = Polish [Education = Bachelor] Dutch [Education = Bachelor]	Actual Risk	0,9586	0,0142		2523,5	0,8093	
	y = Polish [Education = Master] Dutch [Education = Master]		0,9706	0,1086				
2	x = Polish [Education = Bachelor] Dutch [Education = Bachelor]	Perceived Risk	0,9846	0,4868		0,5814		
	y = Polish [Education = Master] Dutch [Education = Master]		0,9790	0,3066				
3	x = Polish [Education = Bachelor] y = Polish [Education = Master]	Actual Risk	0,9654 0,9612	0,2965 0,1834	0,4232			
4	x = Dutch [Education = Bachelor] y = Dutch [Education = Master]	Perceived Risk	0,9676 0,9600	0,3798 0,2744	0,3984			
5	x = Polish [Education = Master] y = Dutch [Education = Master]	Perceived Risk	0,9729 0,9519	0,4408 0,2215	0,8855			
6	x = Polish [Education = Bachelor] y = Dutch [Education = Bachelor]	Actual Risk	0,9653 0,9190	0,2965 0,0081		676	0,6346	