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**THE ROLE OF PERCEIVED RISKS AND RISK MITIGATING
STRATEGIES IN ELECTRONIC COMMERCE**

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I hereby declare that I have compiled the paper independently and all works, important standpoints and data by other authors has been properly referenced and the same paper has not been previously presented for grading.
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ABSTRACT

The aim of this study is to investigate the attitudes of electronic commerce (e-commerce) users towards perceived risks and methods by which their perceived risks can be diminished. A quantitative study is conducted to identify the most highly perceived risk dimensions and the most effective risk mitigating strategies in the e-commerce environment. The study finds that the concerns related to the credibility and reliability of website are perceived as the most significant, followed by risks of privacy and security. Additionally, the findings show that the two most effective risk reduction methods perceived by the online consumer are product information and website functionality. The study, therefore, provides online vendors insight into risks perceived by consumers and demonstrates the importance of this awareness on competitiveness and success in the e-commerce environment.

Keywords: e-commerce, perceived risks, risk mitigating strategies, attitudes, consumer behavior model, Theory of Planned Behavior (TPB)

INTRODUCTION

The adoption of the internet by both consumers and businesses in the last decade has had significant implications on how business is conducted today. The internet has strongly impacted the global market environment and allowed companies to expand their market reach through electronic commerce (e-commerce). E-commerce is the sale of goods and services over the internet, and the rapid development of the internet has allowed e-commerce to develop competitive advantages over other forms of business. E-commerce offers various benefits to consumers and businesses over traditional brick-and-mortar shopping environment, by pushing down product prices, reducing transaction costs, providing convenience and saving of time, decreasing barriers between consumers and businesses, and allowing a greater market reach for businesses.

However, despite the abundance of apparent benefits in e-commerce, concerns regarding this mode of shopping are persisting. Consumers perceive a higher level of risk in the e-commerce environment as compared with traditional brick-and-mortar environment. The issues of perceived risks and trust have emerged, and these issues have become one of the most significant barriers to the growth and success of e-commerce. That is primarily due to the specific nature of the e-commerce environment and consequent lack of face-to-face encounters. Consumers may be reluctant to engage in e-commerce activities as they consciously and unconsciously perceive a high level of risk, which in turn has an adverse effect on their decision-making and purchase intentions. Therefore, understanding the main areas of concern for the consumers, as well as how to attempt to reduce perceived risks is essential for online vendors to establish a successful e-commerce environment.

The continuous growth and popularity of e-commerce make it a relevant and compelling area for research. However, the specific nature of the e-commerce environment leads consumers to perceive more risks than they do in the traditional retail environment. Perceived risks have found to hinder the use of e-commerce, and act as strong antecedent to purchase behavior. Thus, it is important to research and increase understanding of risks perceived by the consumers in the e-commerce environment, as well as the ways in which to reduce those risks.

The aim of this research is hence to determine which dimensions of perceived risk are found to constitute the highest degree of concern for the online consumer and to find out which methods are the most effective in reducing those risks for the online consumer. Based on these objectives, two research questions have been proposed:

RQ1: Which risk dimensions are perceived as the most significant for consumers online?

RQ2: Which risk-reducing strategies are perceived as the most effective in reducing risks?

The research approach starts with establishing the theoretical framework - describing the issues of trust and consumer behavior in relation to perceived risks and identifying the perceived risk dimensions based on thorough review of relevant literature and previous research. Risk reduction methods will be developed based on literature and previous research, and the relationship between perceived risks and risk reduction methods will be illustrated. Thereafter, quantitative methods will be utilized in the form of an online survey to find answers to the two research questions. The attitudes of e-commerce users towards each dimension of risk will be illustrated, and the importance of each method of risk reduction for the e-commerce user will be identified. Based on the data collection, the results will be analyzed and illustrated. The following results will provide the e-marketers and online vendors an insight and perspective on the risks perceived by the online consumers, and the level of concern of each dimension of risk apparent in the online environment. Consequently, the awareness of the effectiveness of each risk reduction method will allow the online vendors to develop appropriate and effective risk mitigating strategies to gain new customers, retain existing ones, and obtain a competitive advantage in the e-commerce marketplace.

In chapter 1, the theoretical framework will be presented. The terms- electronic commerce, consumer behavior, trust, perceived risks, and risk mitigating strategies- will be explained. The consumer decision-making process will be illustrated, and the role of perceived risks and risk mitigating strategies will be described. The relationship between perceived risks, trust, and consumer behavior will be presented. The dimensions of risk and risk reduction methods will be explored, and the relationship between the two will be illustrated.

In chapter 2, the research design is demonstrated. The methods of data collection and sampling are presented. The findings of the study will be analyzed and illustrated, and the discussion and interpretation of the data will take place. Limitations of the research at hand will be discussed, and recommendations will be made for future research.

1. THEORETICAL FRAMEWORK: CONSUMER BEHAVIOR, PERCEIVED RISKS AND RISK MITIGATING STRATEGIES IN ELECTRONIC COMMERCE

In this chapter, an overview of electronic commerce, consumer behavior, trust, perceived risks, and risk mitigating strategies are provided, and the terms are explained. The theoretical framework aims to provide insight into how consumers make decisions in the online environment and what role perceived risks and risk mitigating strategies play in the context of e-commerce. In the first section, an overview of the concept of electronic commerce is provided. The second section describes the consumer decision-making process and the evolution of trust and their relationship to perceived risks. The third section illustrates the dimensions of perceived risks, relevant risk reduction strategies and the relationship between the two.

1.1. The concept of electronic commerce

Information and communication technologies (ICTs) and the internet have brought about a change in how economic transactions are carried out. A growing number of commercial transactions are carried out online. (OECD, IDB 2016) Electronic commerce (e-commerce) is defined as the concept of sales or purchases of goods and services over computer networks, and it can involve both physical, as well as intangible (digital) products and services (UNCTAD 2015).

The perspective for business-to-consumer (B2C) e-commerce depends not only on consumer's acceptance of internet as a viable transaction means but most importantly on consumer's recognition of online retailers as reliable merchants (Pavlou 2003). For businesses, e-commerce offers increased efficiency by reducing operating barriers between business and its customers, reducing costs along the value chain, and providing an increased number of potential customers

due to the broader scope of the market. Under certain conditions, the transaction and marginal production costs of operating on the internet can be brought down to zero. (Kivine 2016)

For consumers, e-commerce offers convenience, by allowing them to make purchases easily whenever they are and have the products delivered to them. The internet provides consumers with a more accessible information collection and price comparison on goods and services. Most importantly, e-commerce can lead to significant savings in time and effort for the consumer by allowing them to find information fast (*Ibid.*).

Overall, e-commerce provides positive effects throughout the economy by broadening the scope of available products, increasing competition, allowing easier price comparisons and lower entry barriers for new firms. Increased competition is due to users' ability to search for products and compare prices on their own, relying on reviews and ratings of previous customers. Businesses can compare prices across firms, lowering the prices for consumers in order to stay competitive. The internet makes it easy for firms to find their customers online by decreasing market entry barriers. (OECD, IDB 2016)

UNCTAD (2015) stated that ICTs act as facilitators of international trade by reducing the barriers to trade, thus promoting the use of e-commerce. By using the internet for e-sales and marketing, firms may be able to reach markets otherwise unreachable due to political systems or distance. Comparisons between offline and online trade have found the effect of distance to be considerably smaller in the case of e-commerce compared to traditional brick-and-mortar stores. That is due to lower information costs apparent in e-commerce. (UNCTAD 2015)

The internet provides every business owner with the same opportunities to succeed, not based on the critical factor of "location", as is the case for traditional brick-and-mortar stores. E-commerce creates an arena, where geographic boundaries have been eliminated, providing small and big businesses the same international platform to compete in. (Warrington *et al.* 2000)

1.2. Consumer behavior in electronic commerce

The internet is a complex platform. Thus, understanding consumers' underlying motives, attitudes, and behaviors in the online environment is crucial to the success of e-commerce (Kivine 2017). Social psychology and sociology provide theories that help explain behavior and formation of trust. According to the Social Exchange Theory (SET), people form relationships based on trust by evaluating the costs and benefits of each action and choosing the one that brings the most satisfaction. Balance Theory (BT) assumes that people tend to develop positive attitudes towards those with whom they have some prior association with. The more experience the user has online, the more likely they have developed prior associations with e-commerce sites, thus developing greater positive attitudes towards e-commerce. Therefore, in the context of e-commerce, user's online experience is argued to be positively related to trust. (Corbitt *et al.* 2003)

The Theory of Planned Behavior (TPB) confirms that behavior is influenced by intentions to act. A determinant of intentions is attitude. According to Jarvenpaa *et al.* (2000), favorable attitudes towards an e-commerce store are found to increase consumers' willingness to purchase from the store. TPB also suggests that a direct influence of perceived risks on intentions exists, and is related to the concept of perceived behavioral control. Perceived behavioral control describes the extent to which the consumer feels that successful engagement in behavior is entirely up to them. In the context of e-commerce, the perceived risks associated with buying online may decrease consumers' perception of control, thus negatively influencing their willingness to purchase online.

1.2.1. Risk perception and behavioral intention

For the purpose of this research, the Theory of Planned Behavior (TPB) and the research model by Gurung and Raja (2016) will be used to describe the consumer decision-making process. Figure 1 intends to incorporate the elements of TPB and risk perception to describe the relationship between perceived risks and attitudes, and illustrate the behavior and its antecedents of online consumers. Risk perception is defined as the degree of uncertainty consumers feel about a specific action that hinders the use of the internet for commercial transactions. Ariffin *et al.* (2018) argue that perceived risks have a significant part in determining attitude and consumer purchase intentions. A highly negative correlation has been found between risk perceptions and attitudes,

and perceived risks are said to be strong predictors of attitude. Since attitudes lead to intentions and actions, reduction of perceived risk is expected to influence willingness to transact. (Pavlou 2003)

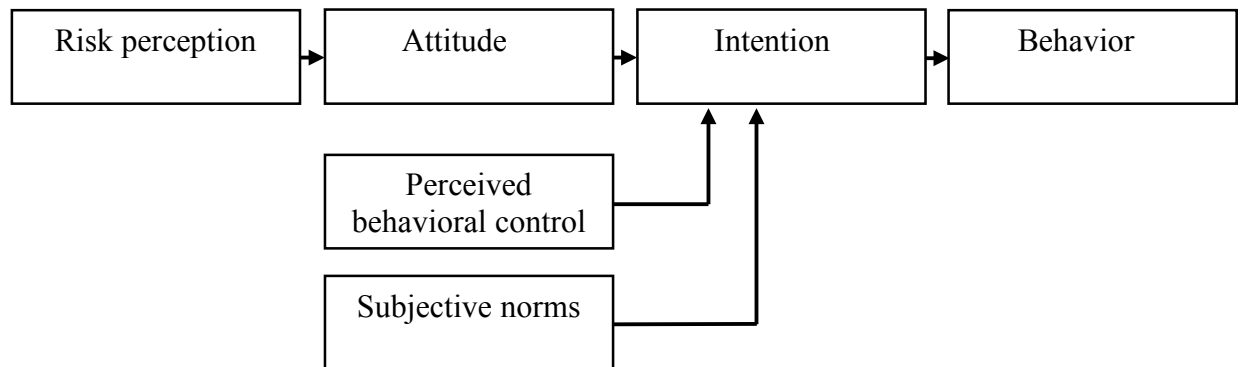


Figure 1. Consumer behavior model

Source: Gurung, Raja (2016)

Gurung and Raja (2016) demonstrated that attitude is a positive or negative feeling the consumer has about engaging in a specific action. In an e-commerce environment, attitude is the consumers' perception and belief of an online vendor, and it is proposed that the higher the levels of perceived risks the more negative the attitudes (*Ibid.*). A positive relationship exists between attitude and intention. The more favorable the attitude of the consumer, the more likely they are to engage in an e-commerce transaction. They also argue that intention is closely related to and followed by actual behavior (*Ibid.*). The higher the positive attitude towards the merchant, the higher the intention to engage in e-commerce activities, and the higher the actual purchase probability (Kivine 2017).

TPB examines the linkage between attitudes, intentions, and behavior, and it argues that subjective norms and perceived behavioral control act as antecedents to intentions. The relationship between perceived risks and intentions can be explained by the concept of perceived behavioral control described in the Theory of Planned Behavior (TPB). TPB presumes that voluntary action is dictated by intention and suggests that direct influence of perceived risk on intentions exist, and it is related to the concept of perceived behavioral control- the extent the consumer feels that successful engagement in behavior is entirely up to them. The author agrees with the ideas of Kim

and Chung (2011) who argue that the higher the perceived behavioral control, the stronger the positive relationship between attitudes and intentions to engage. Consumers' are said to be willing to buy from an online store which they perceive as low risk even if they do not possess highly positive attitudes towards the merchant. On the other hand, consumers may not be willing to buy from a vendor whom they perceive as having a high risk even if they possess positive attitudes towards them. (Jarvenpaa *et al.* 2000) In the e-commerce environment, the perceived risks associated with buying online might decrease the consumers' perception of control, that is the main factor of perceived behavioral control, thus negatively influence one's willingness to buy online. Therefore, perceived risks affect consumers' intentions directly, as well as shape their attitudes. (Kivine 2017)

Subjective norms describe the individuals' perception of what others would think of their given behavior. A definite relationship has been found between subjective norms and behavioral intentions (Gurung and Raja 2016). Subjective norms are the reflection of perceived societal pressure and have a significant positive effect on ones' purchase intentions. The higher the subjective norms and the perceived behavioral control, the higher the intention to engage in a purchase. Hence, a positive relationship is found between attitude, perceived behavioral control, subjective norms – and purchase intention (*Ibid.*).

To sum up the relationship in Figure 1 – the perceived risks in the online environment influence consumers' attitudes. A negative relationship exists between risk perception and attitudes. Attitudes (positive or negative) act as the basis for consumer intentions. A positive relationship exists between attitudes and intentions. Intentions will be followed by an actual behavior - purchase. (Kivine 2017)

1.2.2. Trust beliefs

The increasing use of the internet as a commercial tool between businesses and consumers raises interest in understanding the critical issues in developing relationships with customers online (Kivine 2016). Chen and Barnes (2007,21) define trust as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party”. Trust is believed to be the most critical element in these relationships (Corbitt *et al.* 2003). The lack of trust is argued to be the most significant long-term barrier for consumers to engage

with online vendors, and a critical factor in any relationship that the trustor (e.g., consumer) does not have direct control over the trustee's (e.g., firm) actions (Jarvenpaa *et al.* 2000). Pavlou (2003) argues that trust has long been regarded as an essential element in consumer behavior, especially so in uncertain environments such as e-commerce.

For online retailers, establishing trust is more important than for traditional brick-and-mortar businesses. In the online environment, the adverse conditions of trust such as uncertainty, vulnerability, and dependence are apparent. The consumers lack face-to-face interactions with the seller, the ability to physically see the product or collect it after purchase. Thus, the consumers' expectations will be based on the belief in the merchant's competence, ability, and goodwill to act according to the customers' expectations. (Corbitt *et al.* 2003) Creation of trust is an important element in the process of mitigating perceived risks, and trust and perceived risks have found to have a strong impact on consumer's purchasing decisions in e-commerce (Gurung and Raja 2016). Jarvenpaa *et al.* (2000) showed that trust has a direct positive impact on consumer purchase intentions, and that trust acts as a foundation of successful e-commerce.

1.2.3. Trust and perceived risks

Trust is essentially only required in situations where perceived risks and uncertainty are present. Consumer trust can be described as a function of the level of risk involved in a given situation. (Pavlou 2003) Jarvenpaa *et al.* (1999) demonstrate that trust and risk are closely interrelated, and that trust mitigates consumers' perceptions of the risks involved in a purchase. The author acknowledges that high levels of trust have found to result in lower levels of risk perception, and create more favorable attitudes towards the store (*Ibid.*).

Pavlou (2003) found that trust is crucial in economic transactions where the risk of falling victim to opportunistic behavior is substantial, such as in e-commerce. In the e-commerce environment, trust helps to reduce behavioral uncertainty and risks associated with the possibility that a vendor might behave selfishly. When people develop trust in another party, they assume, that those they trust will behave as expected. Therefore, in the e-commerce environment trust is a vital factor for consumers to believe that a vendor will act with best intentions (*Ibid.*). In general, trust reduces perceived risks, increases satisfaction with exchange relationships, and improves consumers' beliefs about competence and benevolence of vendors (Delina and Tkac 2010). Thus, in e-commerce, consumer perceived risk is found to be negatively related to trust (*Ibid.*). Moreover,

Mitchell (1999) suggests that perceived risk acts as a necessary antecedent for trust to evoke, and trust building results in a reduction of perceived risks. As relationships develop and trust builds, perceived risks will decrease (*Ibid.*).

1.3 Perceived risks in electronic commerce

While many businesses are rapidly adopting the internet as the means through which to conduct business, there are many risks associated with its use (Tan 1999). The most critical part in regards to the acceptance of e-commerce is not the objective transaction security of the online channel but the subjective risk perception of consumers. The theory of perceived risk has long been used to explain consumers' behavior, and it has been conceptualized in the literature as a function of two components: uncertainty and the seriousness of the consequences of the purchase (Cases 2002). Chu and Li (2008) suggest that perceived risks highly hinder the use of e-commerce. Thus, understanding the perceived risk factors, online retailers can develop appropriate methods to help consumers relieve their perceived risks (*Ibid.*). Prior research has found a significant effect of perceived risks on determining consumer purchase intention (Ariffin *et al.* 2018). Based on research by Sharma and Kurien (2017), perceived risks have found to have an inverse relationship with trust, loyalty, and attitude, and the intention to purchase online. While consumers perceive risks in almost all purchase decisions, the perception tends to be higher in non-store purchase decisions. (Doolin *et al.* 2005)

1.3.1. Dimensions of perceived risks

Perceived risk has been defined in the literature as ‘‘the unpredictable results that consumers perceive when they engage in purchasing behavior; these results may have a negative influence on the consumer.’’ (Swiegers 2018, 52). Cases (2002) proposed four risk sources for the electronic shopping context: risk associated with the product, risk associated with the internet as a mode of purchase, risk ensuing from a remote transaction, and risk related to the site on which the transaction takes place. Based on these four sources, five dimensions of risk can be identified: performance, financial, delivery, privacy and source risk. Previous literature confirms that perceived risk is a multidimensional concept, building up of several dimensions of risk (Khan *et al.* 2015). Based on Forsythe *et al.* (2006) findings, these five dimensions of risks are associated with internet shopping and are related to the intention to engage in e-commerce purchases.

Performance risk. The author agrees with Ariffin et al. (2018) that one of the main constraints a customer must overcome when shopping online is the inexistent possibility to check the product physically before buying. Consumers shopping online do not physically see the product and lack the face-to-face communication that reduces consumers' perception of risk in the traditional physical shopping environment. (Khan *et al.* 2015) According to Sharma and Kurien (2017), performance risk is the possibility of the product not meeting its expected performance requirements and delivering the value as per the promise was made. Hence, the performance risk involves a potential loss if the product fails to meet customers' expectations in terms of standard and quality (*Ibid.*). Swiegers (2018) proposed a less formal explanation of performance risk, as the possibility that the product does not work properly or only works for a short period. As the uncertainty of the function of the product increases, the consumers perceive increased performance risk. Product performance risk is largely apparent in the e-commerce environment due to the shoppers' inability to accurately evaluate the quality of the product. (Forsythe *et al.* 2006) In the study by Zheng *et al.* (2012) performance risk was found as the most effective risk dimension for online consumers. Furthermore, Ariffin *et al.* (2018) found that about 25% percent of consumers are worried about the quality of the product ordered online, and that product risk is one of the main reasons why consumers decide not to purchase online. Consumers may perceive product risk if the product has limited information displayed about it on the website, as they may have difficulties evaluating the product. Previous studies show that product risk negatively influences purchase decisions online (*Ibid.*).

Financial risk is defined as the potential monetary loss associated with the purchase of the product (Swiegers 2018). Customers feel the risk in terms of being charged more money after purchase as hidden/maintenance or delivery costs (Sharma and Kurien 2017). Besides, when purchasing online, consumers are faced with the likelihood of suffering a financial loss due to replacement costs due to a faulty product or lack of warranty. A product element that has been reported to determine a consumer's purchase decisions critically is the price of the product. Swiegers (2018) adds that as the monetary value of the product increases, so does the perceived financial risk associated with it. However, in the studies by Zheng *et al.* (2012) and Cases (2002), the perceived risks related to monetary dimensions were found to be the least serious among the risk dimensions.

Delivery risk can be associated with all online shopping (Cases 2002). Because of the nature of e-commerce, consumers who purchase products must wait for their products to be delivered. The frequent occurrence of delivery delays poses time risk to consumers, as they may experience

dissatisfaction and non-repurchase intention. If receiving the ordered product is delayed, a consumer will perceive higher delivery risk which has an adverse effect on their attitude and intention to purchase from the web shop again, thus refraining from shopping online altogether. (Swiegers 2018)

Privacy risk. In purchasing products online, the fundamental financial risk is said to be related to privacy and security concerns (Swiegers 2018). It includes the consumer's sense of insecurity regarding issues such as online credit card usage, usage tracking, and misuse of personal information. A part of shopping online from e-commerce websites is that customers share their personal and financial information (e.g., phone number, email, credit card details, address) with the online merchant. Sharing this information results in customers perceiving a potential loss of control over their personal information. Consumers fear that their personal information will be used without their knowledge and permission. In the worst-case scenario, customers' identity can be stolen and used for fraudulent transactions. (Sharma and Kurien 2017)

Privacy and security concerns are significant and assist in explaining consumers' behavior and perceived risks online. The study by Cases (2002) found risks related to privacy, security, and confidentiality to be the most prevalent concern in the online purchase environment. Privacy in the context of e-commerce is the customers' right to know how, and what information about them is collected, and the right to decide if, and what information they provided will be available to third parties. Security, on the other hand, is the ability of the company to protect its consumers from fraud by applying security measures. (Kivine 2017) Vos *et al.* (2014) stated that security consist of four elements: authentication, auditing, encryption, and authorization. Though online shopping brings ease of purchase to consumers, on the other hand, the absence of security mechanisms will badly affect consumers purchase intentions. (Ariffin *et al.* 2018) Thus, online companies must work hard to create successful security measures, thus establishing privacy and increasing the probability that a consumer will shop online. The most common ways companies establish secure websites is by providing privacy seals, encryption and password protection. (Kivine 2017)

Source risk is the fear of the credibility and reliability of the website (Cases 2002). Yoon (2002) states that website properties are supposed to fulfill the fundamental needs of a website visitor which then contributes to the rise of overall satisfaction and decrease in perceived risks. The technical expertise of the website designer, operational efficiency, usefulness of help functions,

and the speed at which navigation is conducted are all necessary measures of the effectiveness of website performance. Consumers' satisfaction with the website is found to be a function of consumer's satisfaction with the operational aspects of the website. It is vital that a website functions quickly and reliably, as time-saving is one of the main reasons consumers choose to shop online (*Ibid.*). Cases (2002) found source risk to constitute a considerable amount of perceived risk for the consumer, ranking second after privacy risks.

1.3.2. Risk reduction strategies

Roselius (1971) argued that buyers are often concerned about potential loss or failure when purchasing online. He identified a risk reduction strategy as an action initiated by a buyer or seller to reduce perceived risks. When a buyer perceives risks when purchasing online, he could overcome his perception of risk by either reducing the probability that the purchase will fail or by diminishing the severity of real or imagined loss suffered if the purchase does fail. Alternatively, he could decide to switch from one type of perceived loss to another for which he has more tolerance for (*Ibid.*).

A range of past research shows that buyers have a set of many risk-relieving devices; methods, which relieve risk-related hesitancy and serve as catalysts to facilitate purchase intentions (Roselius 1971). Roselius (1971) suggested that the consumer will use a variety of methods such as brand loyalty, brand reputation, information from the vendor, and comparison of the price to reduce risk and increase purchase success. Thus, it is crucial for marketers in the e-commerce environment to know which risk-reduction strategies are essential for internet consumers to be able to reduce these concerns (*Ibid.*)

Zheng *et al.* (2012) and Cases (2002) propose the following risk reduction strategies relevant in the e-commerce environment: product information, brand reputation, brand loyalty, exchange policy, money-back guarantee, existence of a local retailer (package delivery point, store), possibility of communication with the vendor (by phone or email), privacy policy, customer testimonies, privacy seals, and website functionality. A suggestion of classification of the risk reduction strategies is proposed according to the different risk dimensions. In Table 1, the grouping of risk reduction strategies based on the dimension of risk in the context of e-commerce is depicted.

Table 1. Dimensions of perceived risks and relevant risk reduction strategies

Dimension of risk	Risk reduction strategies		
Performance	brand reputation	brand loyalty	product information
Financial	exchange policy	money-back guarantee	existence of local retailer
Delivery	communication with a vendor	delivery tracking	
Privacy	privacy policy	customer testimonies	privacy seals
Source	website functionality		

Source: Cases (2002), Zheng *et al.* (2010), compiled by the author

The acquisition of information by consumers is a way of reducing perceived risks as it allows a comparison of several products or brands and helps consumers to evaluate the consequences of purchasing a particular product. Yeung *et al.* (2010) show that well known and popular brands adopted by consumers are found to be effective during periods of concern, reassuring consumers in terms of quality. Based on Roselius (1971) findings, brand loyalty and reputation ranked as the most favorable risk reduction strategies for consumers, as they evoked extremely positive attitudes in high-risk situations. If the brand image is associated with perceived product quality, it tends to influence consumers' purchase intentions. As such, consumers tend to be faithful to a brand if it has provided satisfaction in the past and they are less inclined to change their preferences to those brands they have never tried before. On the contrary, Cases (2002) found brand loyalty to be one of the least useful risk reduction methods for consumers.

Many customers face doubts about the product quality with the fear that dissatisfaction with the quality will result in loss of money when shopping through e-commerce. An option to exchange the product if not satisfied, will reduce customers perceived risks and help develop trust towards the vendor. Besides, it will encourage customers to shop more. (Shaurma and Kurien 2017) Cases (2002) and Van den Poel and Leunis (1999) found money-back guarantees to be one of the most crucial risk-reducing strategies for the consumer. Moreover, money-back guarantees were found to be extremely relevant for high-risk products. However, Roselius (1971) discovered money-back guarantees to evoke a slightly unfavorable attitude amongst consumers. He found that the risk reduction strategies constantly rated as unfavorable (e.g., money-back guarantee, free sample, endorsements) by consumers are typically the expensive strategies for the companies. He argued that companies might be able to offer equally effective and less-expensive strategies in the reduction of perceived risks. Furthermore, Cases (2002) found that in the case of e-commerce shopping, a customer always needs someone to contact, whether it be a salesperson by email or phone or at a local retail store. If the company has a local retail store or a package delivery point

nearby, the customer feels assured because of the possibility to exchange the product in case of dissatisfaction easily.

Delivery is one of the critical elements in the e-commerce logistics process. Besides the importance of human interaction in the purchase process, the existence of delivery tracking is vital for consumers to feel more secure to purchase in the online environment. Being able to track their product up until delivery diminishes the fear that the delivery will not take place at an agreed time or not take place at all. (Kovac *et al.* 2017)

Privacy and security concerns are considered to be one of the most significant barriers to success in e-commerce, and the biggest evokers of perceived risks to consumers. The most common ways for companies to establish security and decrease consumers perceived risks are providing privacy statements and privacy seals. Privacy statements are informative documents regarding the use and protection of customer's personal data. Privacy seals, on the other hand, are verifications by third parties of the safe environment on the website. (Kivine 2017) According to Vos *et al.* (2014), the key strategy for online vendors to decrease the level of perceived risks is to display privacy seals on their website. For a customer, privacy seals are proof of respectful usage of personal information and help lessen the perceived risks associated with the credibility of the company. (Kivine 2017) Typically, operators of privacy seal programs advocate a set of standards and principles that concern consumers in the online shopping environment. After verification by the privacy seal operator, the website is able to display the label on their site to signal conformance to the label's standards and principles. (Lin *et al.* 2009) Furthermore, customers' perception of their privacy risks will decrease if online vendors allow customers to share their purchase experiences on the website. Testimonials, reviews, and ratings allow consumers to get feedback and recommendations from previous customers of that site, serving as a social cue when embedded on an e-commerce site (Spillinger and Parush 2012). Spillinger and Parush (2012) argue that testimonials have a positive effect on consumers' attitude towards an e-commerce website, thus increasing willingness to purchase.

Source risk is the fear of credibility and liability of the website (Cases 2002). Website functionality is an essential aspect for consumers to evaluate their level of control on the website and the level at which their information needs are adequately fulfilled. Satisfaction with website properties, design and search functionality is found to be positively related to attitude and purchase intention on the site. (Yoon, 2002)

1.3.3. Relationship between perceived risks and risk reduction strategies

Cheng *et al.* (2013) affirm that consumers' behavior in e-commerce involves risk due to unanticipated consequences that their purchasing actions may produce. Roselius (1971) found that consumers, when faced with high levels of risk in the online shopping environment, will rely on risk-reducing methods to mitigate the risk of loss and consequently increase the likelihood of engaging with the online vendor. Figure 2 depicts the links between perceived risks, risk-reduction strategies, and purchase intention.

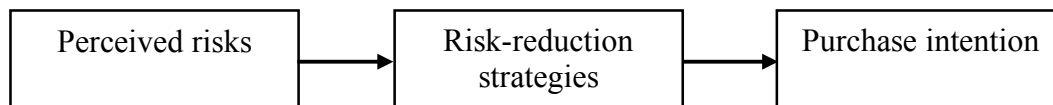


Figure 2. Relationship between perceived risks and risk reduction strategies

Source: Chu, Li (2008)

When consumers seek to purchase products or services online, risks are perceived primarily due to the nature of the online shopping environment. Once consumers are aware of the seriousness of the perceived risks, they take steps to reduce those risks by looking for related risk mitigating strategies. Kunze and Mai (2007) argue that from the consumer's perspective, to reduce perceived risks is to improve the certainty of their prediction of the possible outcome of their decision. Consumers look for risk-reducing strategies that make them more comfortable with engaging in a purchase or that reduce their level of risk until it is below their acceptable level. The higher the perceived risks, the more likely it is that the consumers will look for risk mitigating strategies. Furthermore, the more effective the risk reduction strategy in the eyes of the consumer, the more likely the consumer is to develop an intention to engage with the online vendor. Risk reduction strategies help stimulate consumers purchase intentions by reducing the degree of uncertainty they feel while shopping online. (Chu and Li 2008) Besides, Doolin *et al.* (2005) found that the consumers that place importance on the perceived risks of internet shopping are less likely to engage in purchases online.

2. RESEARCH METHODOLOGY

This chapter aims to provide answers to the two research questions - which risk dimensions are perceived as the most significant for consumers online, and which risk-reducing strategies are perceived as the most effective in mitigating risks. That is done by conducting empirical research. In the first section, methods of data collection and sampling will be brought out. The findings of the study will be presented- the consumers' attitudes towards different dimensions of risk and risk mitigating strategies are illustrated. The analysis and discussion of the findings will be provided, and limitations of the study as well as recommendations for future research will be presented.

2.1. Methods of data collection

This research was carried out using quantitative research methods. The data was collected using a self-administered survey method, as it is easy to administer, low cost, and a reliable means to conduct quantitative research. A questionnaire was distributed via a social media channel, and the data collection period was between 27 February and 6 March, during which the survey received 104 responses. The target group of the study was people with previous online purchasing experience. The survey was based on the premise that the respondent has made online purchases, and it was divided into four sections of questions.

The first part started with general questions, to ease the respondents into the questionnaire. The second and third parts of the questionnaire were focused on providing answers to the two research questions. Finally, in the fourth part of the questionnaire, personal demographic questions (e.g., age, gender) were asked. The survey items were derived based on literature and previous research to minimize potential problems with the reliability and validity of the questionnaire. The original questionnaire can be found in Appendix 1. The first section of the survey measured the respondents' general characteristics in regards to their behavior and previous experience in online shopping. It aimed to gain an overall view of consumers' previous online purchase experience and, the level of satisfaction with online shopping.

The second section of the questionnaire was seeking to find an answer to the first research question- which risk dimensions are perceived as the most significant for consumers online. The risk dimensions were generated based on a thorough review of relevant literature, and correspond to the five dimensions brought out in Table 1. The degree of significance of each risk dimension was tested using a five-point Likert scale, anchored with ‘strongly disagree’ and ‘strongly agree’, with the third point standing at ‘neutral’. The respondents were presented with 15 statements related to their concerns in the online environment, three statements corresponding to each of the five risk dimensions, and the respondents were asked to rank how much they agree or disagree with the statements. The survey items were aimed to measure the significance of the variable of risk perception in the consumer behavior model and the variable of perceived behavioral control derived from TPB and allow for subsequent interpretation of consumers’ purchase intentions under perception of risk. The variables used to measure all risk dimensions can be found in Appendix 2. The items were presented in the form of a descriptive statement. Each of the statements was derived based on previous research and literature and described a situation of risk that occurs under each risk dimension (Cases 2002, Zheng *et al.* 2010). That way, the concern of different risks for the consumer in the online environment could be derived, and the relative significance of each risk dimension could be described.

The third section of the questionnaire was looking to provide an answer to the second research question- which risk-reducing strategies are perceived as the most effective in reducing risks. Risk reduction strategies brought out in Table 1 were used as the basis for testing the research question. The respondents were presented with 12 statements, each one corresponding to one of the risk reduction methods in Table 1, and linking perceived risks to consumers purchase intention as depicted in Figure 2. A five-point Likert scale was used to measure the importance of each risk reduction method, anchored with two positive statements ‘important’, ‘very important’, and two negative statements ‘less important’, ‘not important at all’ and ‘no opinion’. The respondents were asked to rank how important they perceive each of the statements to them when shopping online. That way, the consumers’ attitudes related to different risk-reduction methods could be tested, and the most effective methods of reducing risk could be described. The details of variables used to measure all risk reduction strategies can be found in Appendix 2.

The last part of the questionnaire focused on general demographic variables. It aimed to establish the respondents' age, gender, and background.

2.2. Sampling

Non-probability sampling techniques were applied, and judgement sampling was used as an appropriate method of sampling. A judgement sampling method involves obtaining data from a sample of the population by targeting units of population based on the researcher's knowledge and professional judgement. Judgement sampling method allows approaching the target audience directly, while consuming minimum execution time (Bhat 2019). Participation in e-commerce is largely dictated by the availability and market penetration of credit cards and electronic payment methods, as well as consumers' habits of using e-commerce. Therefore, judgement sampling allowed to cover very diverse population units to comprehensively measure the overall risk perception of e-commerce users based on these two characteristics- the spread of electronic payment methods and the market share of e-commerce.

This study aimed to target e-commerce users from three distinct geographical areas with dissimilar accessibility to electronic payment methods and habits of e-commerce usage – the United States, Estonia/Finland and Spain.

In the United States, electronic transactions are growing rapidly, and North America has become the first region to execute more than half of its transactions online. In Estonia and Finland, the online payment systems are highly advanced but the market shares of e-commerce are one of the lowest in Europe. In Spain, on the other hand, the share of electronic commerce is one of the lowest in Europe and electronic payment methods relatively underused. (McKinsey & Company 2018)

It should be emphasized that the aim of the study was not to compare the perception of risk based on the respondents' geographical origin, but rather to obtain an overall understanding of perceived risks of e-commerce users by allowing to comprise the sample of e-commerce users from three distinct geographical locations, all differing in the two main characteristics enabling e-commerce.

The sample comprised 104 respondents of whom 50 (48%) were men, and 54 (52%) were women. The main demographic characteristics of the sample are presented in Table 3. Over half of the respondents, 60%, belonged to the age group 18-29 years of age. Respondents originated from 20 different countries, overwhelmingly majority of respondent hailing from three identified priority markets: US/Canada, Spain and Estonia/Finland. Few additional respondents provided their inputs from other countries too, but most of them also reside either in the US or Spain on temporary bases and do not have a material effect on altering the data as such, also given the

non-geographic focus of the analyses. The precise data concerning the demographic variables can be found in Appendix 2.

Table 3. Demographic characteristics of the sample.

Sample characteristics		Frequency	Percentage
Gender, n=104	Man	50	48%
	Woman	54	52%
Age, n=104	18 to 29 years	63	60%
	30 to 39 years	8	8%
	40 to 49 years	10	10%
	50 years or older	23	22%
Origin, n=104	Estonia&Finland	44	43%
	USA&Canada	23	22%
	Spain	19	18%
	Other	18	17%

Source: Author's calculations based on data provided in Appendix 2

2.3. Findings

The first part of the questionnaire was looking to describe the general characteristics of the sample in regards to experience and attitude with online shopping and obtain a background of the participants. Over one-third of the participants said that they shop online more than two times a year. It can be concluded that over half of the respondents are regular users of e-commerce, with 32% of respondents saying that they shop online one to two times a month.

Additionally, the general attitude towards online shopping was found to be highly positive, standing at 88%. Besides, when asked about satisfaction with previous online purchases, over half of the respondents, 57%, were satisfied with their prior online shopping experiences.

Table 4. General characteristics of the sample

General characteristics		Frequency	Percentage
Internet shopping behavior (frequency), n=104	More than 2 times a year	34	33%
	1 to 2 times a month	33	32%
	More than 2 times a month	26	25%
	1 to 2 times a year	11	10%
General attitude towards online shopping, n=104	Positive	92	88%
	Negative	7	7%
	No opinion	5	5%
Satisfaction with previous online purchases, n=104	Very satisfied	32	31%
	Satisfied	59	57%
	Neutral	9	8%
	Dissatisfied	3	3%
	Very dissatisfied	1	1%
Most important reason for shopping online, n=104	Wide product selection	28	27%
	Saving of time	26	25%
	Convenience	25	24%
	Ability to compare prices	22	21%
	Ability to shop 24/7	3	3%

Source: Author's calculations based on data provided in Appendix 2

The last question in the first part of the survey asked the participants to choose the main reason for shopping online. The five reasons developed based on review of literature and previous research, all ranked quite equally, with the exception of "ability to shop 24/7" ranking as the least important reason, with 3%. "Wide product selection" was found to be the most favorable incentive to shop online by respondents, standing at 27%.

The second part of the questionnaire was seeking to find an answer to the first research question - which risk dimensions are perceived as the most significant for consumers online. Three statements were developed for each of the five risk dimensions to assess the significance of each dimension. The respondents were asked to indicate, on a five-point Likert scale, how much they

agree with each of the statements. All 15 statements and respondents level of an agreement are depicted in Figure 3, and sorted in a descending order based on the degree of "strongly agree".

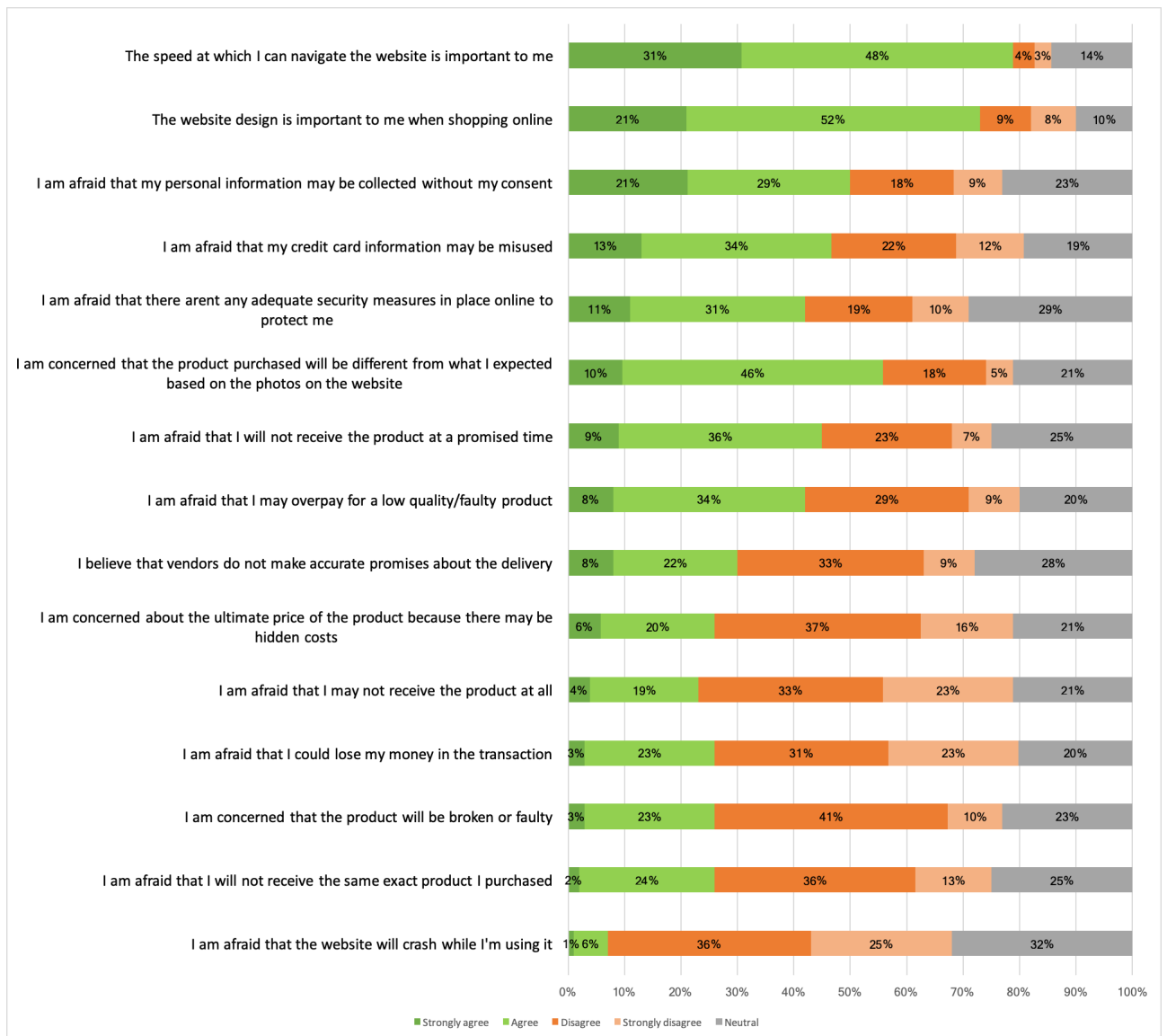


Figure 3. Level of concern regarding the risk dimensions, n=104
 Source: Author’s calculations based on data provided in Appendix 2

All statements were structured in a way that agreeing with the statement indicates a level of significance of the perceived risk element. The structure and grouping of the statements and precise data can be found in Appendix 2. The data in Figure 3 shows that website navigation speed and website design are the biggest concerns for online shopping. Website design and navigation are both parts of the risk dimension – source risk. 31% of the respondents strongly agree that website navigation speed is an essential aspect for them to shop online. Interestingly, the third variable

tested for source risk – fear of website malfunction (crash), ranked the last in Figure 3, only 1% of respondents replying ‘‘strongly agree’’ to the concern, indicating the least concern for that variable for consumers in the online shopping environment. However, it also received the highest percentage of ‘‘neutral’’ responses. Results also show that respondents are concerned about the safety of their personal information in the online shopping environment. 21% of respondents strongly agree that they are afraid that their personal information might be collected without their consent. Fear of personal information collection without consent is a variable corresponding to the risk dimension – privacy risk.

To provide an answer to the first research question- which risk dimensions are perceived as the most significant for consumers online- all statements were grouped into their corresponding dimensions, and the mean values were found for all five dimensions. Figure 4 depicts the mean scores, on a five-point scale, for the five risk dimensions studied.

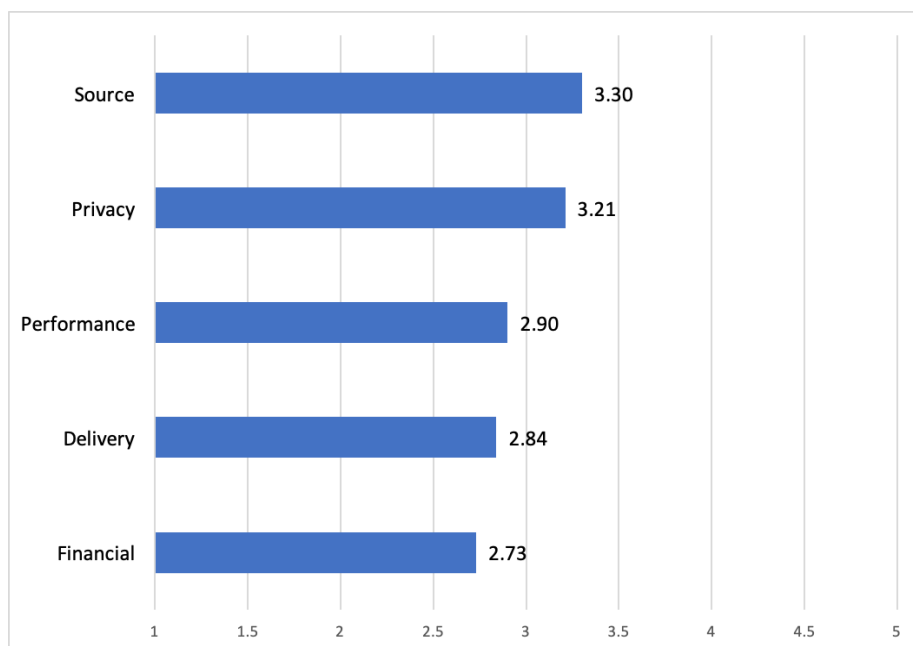


Figure 4. Means of perception of risk dimensions on a 5-point scale, n=104
Source: Author’s calculations based on data provided in Appendix 2

Among the five perceived risk dimensions, source risk associated with fear of credibility and reliability of the website ranked first as the predominant risk dimension. Dimensions such as privacy and performance ranked as the second and third predominant risk dimension, respectively. That shows that problems associated with the credibility of the website, confidentiality, security, and expectation for the product constitute a significant risk in the online shopping environment.

In contrast, the dimensions associated with remote shopping and monetary aspects – delivery and financial risks were found to be the least important factors.

In Table 5, the risk dimensions and their respective mean scores and standard deviations (SD) are depicted. The mean scores allow us to understand the average level of agreement to each risk dimension amongst the participants, thus allowing us to interpret the level of concern towards each risk dimension whereas standard deviation is helpful in interpreting the level of dispersion amongst the opinions of the respondents. SD measures the degree that data points deviate from the mean. The lower the SD, the closer the data points are to the mean; thus, the less dispersed the opinions of the respondents.

Table 5. Means and standard deviations of perceived risk dimensions.

Risk dimension	Mean	Standard Deviation (SD)
Source	3.30	1.268
Privacy	3.21	1.218
Performance	2.90	1.089
Delivery	2.84	1.157
Financial	2.73	1.170

Source: Author’s calculations based on data in Appendix 2

As is portrayed in Table 5, source risk turned out to have the highest mean score, indicating the highest degree of agreement – the highest level of concern of the five risk dimensions. However, source risk also bears the highest SD. It can be interpreted that although the respondents possess the highest level of agreement towards source risk, the opinions are also highly dispersed. The reason for that can be seen in Figure 3. Website design and website speed both have the highest level of agreement amongst the participants. However, the third variable of source risk – the fear that the website might malfunction (crash) has the lowest level of agreement amongst the participants as it ranks as the last, with just 1% of participants strongly agreeing.

The third part of the questionnaire was seeking to answer the second research question – which risk-reducing strategies are perceived as the most effective in reducing risks. A total of 12 risk reduction strategies were measured, and they correspond to risk-reduction strategies illustrated in Table 1. Figure 5 depicts the 12 statements for risk reduction strategies and the degree of importance of each.

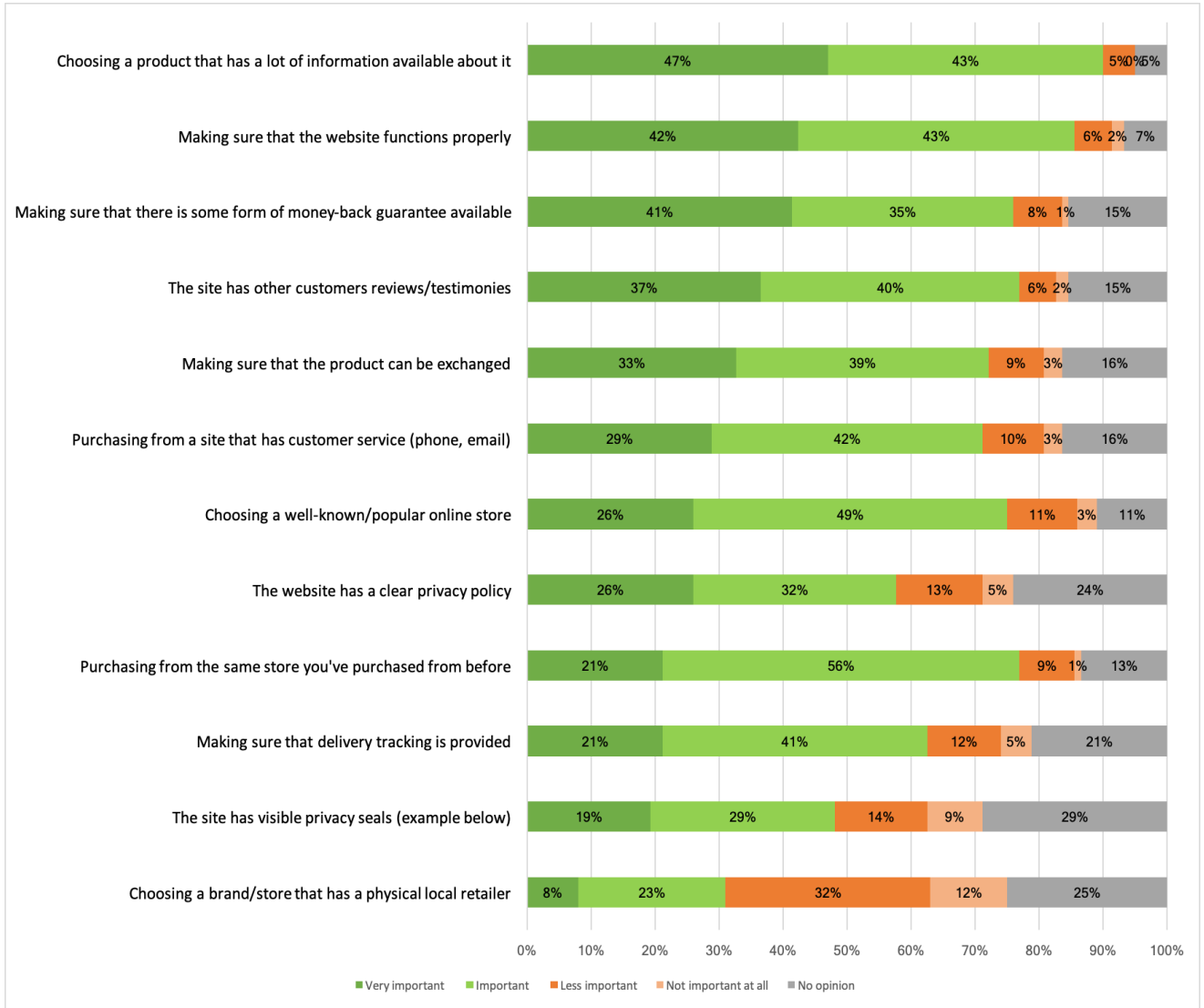


Figure 5. Level of importance of risk reduction methods, n=104
 Source: Author's calculations based on data provided in Appendix 2

The precise data and variables used to measure all risk reduction strategies can be found in Appendix 2. According to the responses, the three most effective risk reduction strategies were product information, website functionality, and money-back guarantee. At the other end of the list ranked- the existence of a local retailer and privacy seals. Only 8% of respondents believed that the existence of a local retailer is very important to them when doing online shopping, and 19% of respondents said that having visible privacy seals on the website is an important aspect to them. Interestingly "Purchasing from the same store you've purchased from before" was believed to be very important for only 21% of respondents, but over half, 56% of respondents, believed it to be important.

To provide an answer to the second research question - which risk-reducing strategies are perceived as the most effective in reducing risks – the average values of all twelve statements each corresponding to one risk reduction strategy were found. Figure 6 illustrates the mean values for each of the 12 risk reduction strategies, on a four-point scale, excluding ‘no opinion’. The research revealed the top two most effective risk reduction strategies shopping online are product information and website functionality.

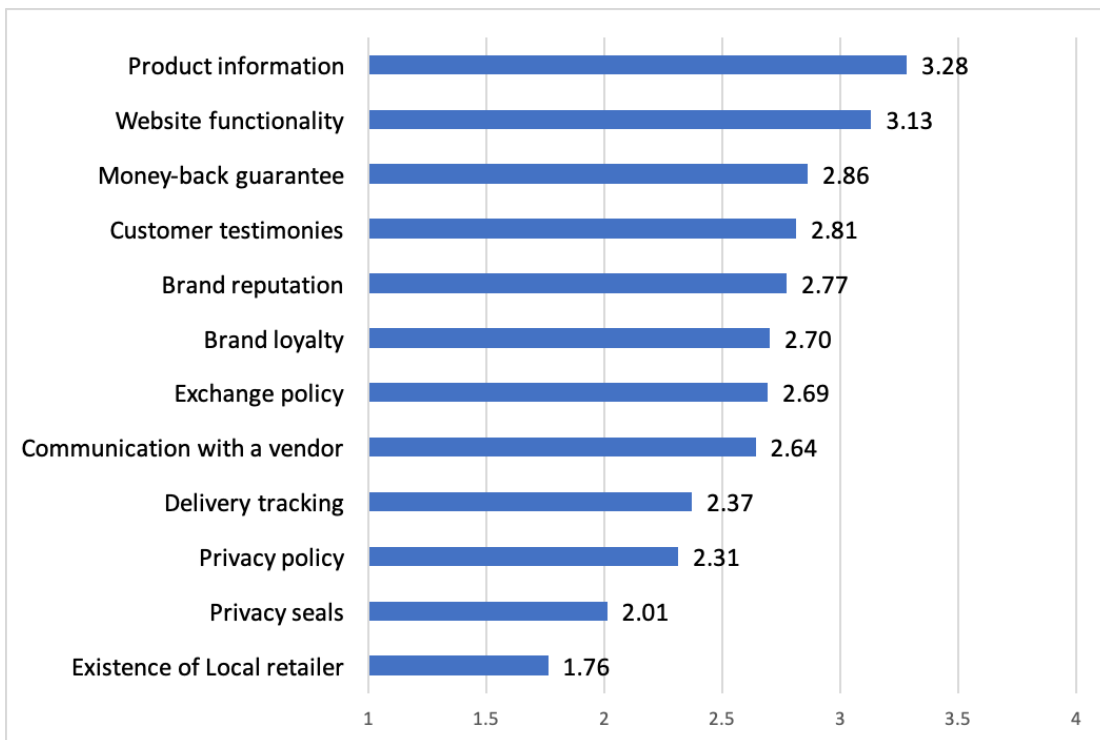


Figure 6. Means of risk reduction methods on a 4-point scale, n=104
 Source: Author’s calculations based on data provided in Appendix 2

Availability of product information was found to have the highest mean score at 3.28, thus being perceived as the most important risk reduction method for online consumers. Website functionality ranked second with a mean of 3.13, and the existence of a local retailer is the least important factor for the consumer, having a mean of 1.76 out of 4.

In Table 6 the means and SD of all 12 risk reduction strategies are shown. Product information was found to have the highest mean and the lowest SD of all variables, at 3.28 and 0.600 respectively. The lowest dispersion of opinions and the highest level of positive opinions were found for the variable ‘product information’. The variable ‘brand loyalty’ received a mean score of 2.70 but the second lowest SD after ‘product information’, at 0.695. That shows that a high

level of consensus was noted amongst the participants, although it did not rank as the most important risk reduction method for the respondents, overall.

Table 6. Means and standard deviations of risk reduction methods

Risk Reduction Methods	Mean	Standard Deviation (SD)
Product information	3.28	0.600
Website functionality	3.13	0.702
Money-back guarantee	2.86	0.800
Customer testimonies	2.81	0.799
Brand reputation	2.77	0.764
Brand loyalty	2.70	0.695
Exchange policy	2.69	0.854
Communication with a vendor	2.64	0.844
Delivery tracking	2.37	0.917
Privacy policy	2.31	0.999
Privacy seals	2.01	0.926
Existence of local retailer	1.76	0.916

Source: Author's calculations based on data in Appendix 2

The findings of the study suggest that source risk - the concerns regarding the credibility and reliability of the website and privacy risk- an invasion of ones' personal information and anonymity online are perceived as the most significant for an online consumer. The top three most effective risk reduction strategies for the online consumer were found to be the availability of product information and website functionality.

2.4. Discussion of findings

The study aimed to determine which dimensions of perceived risk are found to constitute the highest degree of concern for the online consumer and to find out which methods are the most effective in reducing those risks for the online consumer. Thus, the study intended to answer the following research questions:

RQ1: Which risk dimensions are perceived as the most significant for consumers online?

RQ2: Which risk-reducing strategies are perceived as the most effective in reducing risks?

The findings show that most of the respondents are frequent users of e-commerce, possess highly positive attitudes towards online shopping, and are satisfied with their previous online shopping experience. The findings provide an answer to the first research question, indicating that among the five dimensions identified, the risks related to the credibility and reliability of website (source risk) is by far the highest perceived risk dimension, followed by risks of confidentiality (privacy risk) in the online environment.

The findings provide an answer to the second research question, indicating that by far the two most effective risk reduction methods are product information and website functionality.

The findings are consistent with previous research by Cases (2002) who found privacy and source risk to be the two most highly perceived risks. Cases (2002) found privacy risks to be the most effective risk dimension. That may be attributed to the relatively low levels of security and inefficient privacy protection laws in e-commerce at the time the study was conducted. As e-commerce has developed rapidly in the recent years, the fears related to the privacy and security issues might have started to diminish slightly, and the issues of credibility and reliability of a website have become a more significant concern due to the popularity of online shopping and subsequent rise in fraudulent websites.

The results of this study reveal source risk to be the most significant dimension of perceived risk. There could be three interpretations of that. First, the respondents of this study possess abundant online shopping experience and high satisfaction with their previous purchases. Therefore,

concerns about accurate delivery and monetary loss might be diminished, as previous positive experiences have contributed to the development of positive attitudes towards e-commerce. That notion supports the Balance Theory, which states that people tend to form positive attitudes towards those with whom they have prior associations with. Thus, previous positive experiences develop positive attitudes, which offset the perception of risk and positively affect consumers' intentions and subsequent behavior. Besides, 60% of the respondents belonged to the 18-29-year-old age group, who generally possess a higher degree of positive attitudes towards e-commerce due to excessive internet usage and familiarity with it. Secondly, Cases (2002) measured the perception of risk in the context of purchasing a clothing item which is considered a high involvement product- entailing a higher degree of inherent risk perception for the consumers.

Moreover, the high degree of perception of source risk found in this study can also be explained by time being a factor of source risk. The findings show that one of the main reasons for shopping online is the saving of time, thus it can be suggested that consumers place high importance on the website functions to provide a fast and reliable user experience. The perceived risks related to monetary dimensions are considered the least serious among the five dimensions, which correlates with the findings of Zheng *et al.* (2010) and Cases (2002) who found financial risks to be less of a concern compared to other dimensions. That may suggest consumers' confidence in appropriate measures in place to protect them from monetary loss, and it may also be contributed to the increasing number of online vendors offering return and money-back policies.

The availability of information about the product seems to play an important role in reducing risks, thus encouraging subsequent purchase intentions. The findings support Zheng *et al.* (2010) findings showing that consumers value the information about the product the highest, compared to other risk reduction methods. This suggests that the more information there is available about a product, the less risk the consumers perceive. However, the risk reduction strategies – brand reputation and brand loyalty- found to be the most useful strategies by Roselius (1971), obtained mediocre mean scores in this study, ranking fifth and sixth, respectively. Nonetheless, the second lowest SD for brand loyalty out of all risk reduction methods suggests that it evokes a high degree of consensus and significant positive effects amongst the respondents, with over 56% of respondents finding brand loyalty to be an important measure. The findings of this study deviate from those of Roselius (1971) who found money-back guarantee to be one of the least favorable strategies for reducing risk, whereas in this study it ranked as the third most highly favorable strategy. It can be suggested that money-back guarantees are especially relevant in an uncertain e-

commerce environment, and for high-risk products. Notably, privacy seals and privacy policy received relatively low scores in this study. That allows us to speculate that consumer's awareness of the measures used by vendors to ensure their privacy and security may not be apparent nor sufficient.

These findings suggest practical implications for online vendors. In light of these findings, online retailers should be encouraged to propose more information about their products, as well as enhance perceived ease of use, perceived usefulness and appeal of their websites in order to reduce the level of perceived risks. For example, product comparisons, high-quality and detailed pictures and information on materials and accurate sizing is all information that allows the consumer to develop a more concrete idea of the product. When the perception of online shopping is that it's difficult and time-consuming, the consumers might be tempted to abandon online shopping and return to the traditional methods. Therefore, it is recommended that online vendors pay close attention to the position of product information. Additionally, information search processes should be in place for consumers to search for a wide variety of product options, making their online shopping experience easier and less time consuming. Besides, money-back guarantees should be provided in some form as well as the reviews of previous customers. Money-back guarantees help in developing customers' trust and help in retaining customers. Customer's perception of risk of online retailers will decrease when customers are allowed to share their experiences, subsequently increasing the customers' intent to purchase.

2.5. Limitations and recommendations for future research

The most prominent limitations of this study are related to the sampling method and sample size. Judgement sampling does not allow for generalization of the results to the population, and a researcher's bias in selecting the sample is likely. As in this study, the majority, 60% of the respondents belonged to the age group 18-29 years, the results cannot be generalized to the whole population. Besides, the sample size was 104 respondents, which provides a good overview of general attitudes of the target population, but does not allow for an accurate representation of a larger population. Also, the data was collected in a survey method and distributed via a social media channel, which further limits the reliability of the results due to the inability to control sample elements, which might have resulted in a high response and non-response error due to the absence of face-to-face interactions.

Additionally, the perceived risk dimensions and risk-reducing strategies were developed based on previous research on the most common and frequently appearing factors, thus limiting the scope of the research, not considering all the possible factors associated with perceived risks.

Moreover, future research should be expanded to consider all the possible risk dimensions and risk reduction methods, and measure the direct effects of perceived risks on consumers' purchase intentions. The research could be focused on measuring the effect of perceived risks on subsequent purchase intentions for a specific product category. The effect of subjective norms and previous purchase experience on attitudes and intentions could be measured, and the results could be compared based on demographic or other variables.

CONCLUSION

The rapid development of e-commerce has brought about new risks with this mode of shopping. Understanding consumers perceived risks in the e-commerce environment is critical for the online vendors and e-marketers as perceived risks have a direct influence on attitudes, which in turn have a significant effect on intentions and subsequent behavior. Therefore, clearly understanding what concerns the customers and how to minimize the risks perceived, plays an important role in predicting their intentions and shopping behavior. This research aimed to provide insight for online vendors and e-marketers of the attitudes and concerns of online consumers. This knowledge allows them to work towards applying appropriate and effective measures to diminish the risks perceived by their customers and work towards realizing the full potential of e-commerce. Therefore, the main objective of this study was to determine which dimensions of risk are perceived as the most significant for the online consumers, and discover which risk mitigating methods are perceived as the most effective for the online consumers.

The research findings showed that the two most significant dimensions of risk for the online consumer are source risk- the fear of credibility and reliability of the website and privacy risk- fear of invasion of one's personal information and insecure transactions. One of the main benefits to consumers of online shopping is the saving of time. Therefore, website properties are supposed to fulfill the fundamental needs of the visitor, thus contributing to the rise of the overall satisfaction and reduction in perceived risks.

The findings illustrated that the two most predominantly effective risk reduction methods are product information and website functionality. Product information ranked as the most effective method of reducing risk. Availability of information about the product allows the consumer to develop a clear, concise idea about the nature of the product, lowering the level of risks perceived, and subsequently increasing the likelihood of purchase intention.

Based on the research findings it can be interpreted that consumers place high importance on the website functions to provide fast and reliable user experience, and are concerned less about the monetary loss in the online shopping environment, which may suggest consumers' confidence in appropriate measures in place to protect them from monetary loss. Based on the findings, it became apparent that for consumers the most important aspect of risk reduction is the availability of product information. It can thus be interpreted that the more information the consumer is able to collect, the lower the perceived risks in the purchase environment, and the higher the subsequent intention to engage with the online vendor.

The findings suggest practical implications for e-marketers and online retailers. The awareness of customers' concerns and ways in which to mitigate them allows the online vendors and e-marketers to work towards creating successful measures to diminish the perceived risks of customers, and build successful relationships with their clients. Thus, the online vendors should focus on providing thorough information about their products and enhance perceived ease of use, usefulness and appeal of their websites. This, in turn, will decrease the level of risks perceived by the consumers, develop higher positive attitudes and subsequently increase the willingness of consumers to engage with the vendor.

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APPENDICES

Appendix 1. Questionnaire

The following questionnaire is intended for those who have made online purchases

Part 1: General questions

1. How often do you shop on the internet?
 - 1) More than 2 times a month
 - 2) 1-2 times a month
 - 3) More than 2 times a year
 - 4) 1-2 times a year
 - 5) Never [Never=end of questionnaire]

2. Do you usually shop from platforms (such as Amazon) or directly at vendors' websites?
 - 1) Platforms
 - 2) Directly from vendors' websites
 - 3) Other...

3. Which do you prefer?
 - 1) Shopping from platforms (such as Amazon)
 - 2) Shopping directly from vendors' websites
 - 3) I don't know

4. How do you generally feel about using the internet to purchase products/services?

Positive Negative No opinion

5. How satisfied are you with your previous online purchases overall?
 - 1) Very satisfied
 - 2) Satisfied
 - 3) Neutral
 - 4) Dissatisfied
 - 5) Very dissatisfied

6. Which of the following is the most important to you when shopping online? (Please choose one)
 - 1) Convenience of shopping in the privacy of your own home
 - 2) Wide product selection
 - 3) Ability to compare prices
 - 4) Saving of time
 - 5) Ability to shop 24/7

Part 2: Please rank, how much you agree or disagree with the following statements when shopping online

(Strongly disagree, Disagree, Neutral, Agree, Strongly agree)

1. I am concerned that the product purchased will be different from what I expected based on the photos on the website
2. I am concerned that the product will be broken or faulty
3. I am afraid that I will not receive the same exact product I purchased
4. I am afraid that I could lose my money in the transaction
5. I am afraid that I may overpay for a low quality/faulty product
6. I am concerned about the ultimate price of the product because there may be hidden costs
7. I am afraid that I will not receive the product at a promised time
8. I am afraid that I may not receive the product at all
9. I believe that vendors do not make accurate promises about the delivery
10. I am afraid that my personal information may be collected without my consent
11. I am afraid that there aren't adequate security measures in place online to protect me
12. I am afraid that my credit card information may be misused
13. I am afraid that the website will crash while I'm using it
14. The website design is important to me when shopping online
15. The speed at which I can navigate the website is important to me

Part 3: How important are the following aspects to you when purchasing on the internet?

(Not important at all, Less important, No opinion, Important, Very important)

1. Choosing a well-known/popular online store
2. Purchasing from the same store you've purchased from before
3. Choosing a product that has a lot of information available about it
4. Making sure that there is some form of money-back guarantee available
5. Making sure that the product can be exchanged
6. Choosing a brand/store that has a physical local retailer
7. Purchasing from a site that has customer service (phone, email)
8. Making sure that delivery tracking is provided
9. The website has a clear privacy policy
10. The site has visible privacy seals (example below)
11. The site has other customer's reviews/testimonies
12. Making sure that the website functions properly

Part 4: Demographic questions

1. What is your age?
 - 1) 18-29
 - 2) 30-39
 - 3) 40-49
 - 4) 50+
2. And your gender?
 - 1) Woman
 - 2) Man
3. Last, but not least. Where are you from?

Source: Compiled by the author

Appendix 2. Survey data

Questions	Answers	Frequency	Percentage
Part 1. General questions			
Q1: How often do you shop on the internet? (if "never"= end of questionnaire)	a) More than 2 times a month b) 1-2 times a month c) More than 2 times a year d) 1-2 times a year e) Never	a) 27 b) 32 c) 34 d) 11 e) 0	a) 26% b) 31% c) 33% d) 10% e) 0%
Q2: How do you generally feel about using the internet to purchase products/services?	a) Positive b) Negative c) No opinion	a) 92 b) 7 c) 5	a) 88% b) 7% c) 5%
Q3: How satisfied are you with your previous online purchases overall?	a) Very satisfied b) Satisfied c) Neutral d) Dissatisfied e) Very dissatisfied	a) 32 b) 59 c) 9 d) 3 e) 1	a) 31% b) 57% c) 8% d) 3% e) 1%
Q4: Which of the following is the most important to you when shopping online? (Please choose one)	a) Wide product selection b) Convenience of shopping in the privacy of your own home c) Ability to compare prices d) Saving of time e) Ability to shop 24/7	a) 28 b) 25 c) 22 d) 26 e) 3	a) 27% b) 24% c) 21% d) 25% e) 3%

The table continues on the following page

Part 2. Perception of risk dimensions				
Q5: Please rank, how much you agree or disagree with the following statements				
Risk Dimension	Statement	Scale	Frequency	Percentage
Performance	I am concerned that the product purchased will be different from what I expected based on the photos on the website	a) Strongly agree b) Agree c) Neutral d) Disagree e) Strongly disagree	a) 10 b) 48 c) 22 d) 19 e) 5	a) 10% b) 46% c) 21% d) 18% e) 5%
Performance	I am concerned that the product will be broken or faulty		a) 3 b) 24 c) 24 d) 43 e) 10	a) 3% b) 23% c) 23% d) 41% e) 10%
Performance	I am afraid that I will not receive the same exact product I purchased		a) 2 b) 25 c) 24 d) 43 e) 10	a) 2% b) 24% c) 25% d) 36% e) 13%
Financial	I am afraid that I could lose my money in the transaction		a) 3 b) 24 c) 21 d) 32 e) 24	a) 3% b) 23% c) 20% d) 31% e) 23%
Financial	I am afraid that I may overpay for a low quality/faulty product		a) 8 b) 36 c) 21 d) 30 e) 9	a) 8% b) 34% c) 20% d) 29% e) 9%
Financial	I am concerned about the ultimate price of the product because there may be hidden costs		a) 6 b) 21 c) 22 d) 38 e) 17	a) 6% b) 20% c) 21% d) 37% e) 16%
Delivery	I am afraid that I will not receive the product at a promised time		a) 10 b) 37 c) 26 d) 24 e) 7	a) 9% b) 36% c) 25% d) 23% e) 7%
Delivery	I am afraid that I may not receive the product at all		a) 4 b) 20 c) 22 d) 34 e) 24	a) 4% b) 19% c) 21% d) 33% e) 23%

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Appendix 2 continued

Risk Dimension	Statement	Scale	Frequency	Percentage
Delivery	I believe that vendors do not make accurate promises about the delivery	a) Strongly agree b) Agree c) Neutral d) Disagree e) Strongly disagree	a) 8 b) 23 c) 29 d) 34 e) 10	a) 8% b) 22% c) 28% d) 33% e) 9%
Privacy	I am afraid that my personal information may be collected without my consent		a) 22 b) 30 c) 24 d) 19 e) 9	a) 21% b) 29% c) 23% d) 18% e) 9%
Privacy	I am afraid that there aren't adequate security measures in place online to protect me		a) 12 b) 32 c) 30 d) 20 e) 10	a) 11% b) 31% c) 29% d) 19% e) 10%
Privacy	I am afraid that my credit card information may be misused		a) 13 b) 35 c) 20 d) 23 e) 13	a) 13% b) 34% c) 19% d) 22% e) 12%
Source	I am afraid that the website will crash while using it		a) 1 b) 6 c) 33 d) 38 e) 26	a) 1% b) 6% c) 32% d) 36% e) 25%
Source	The website design is important to me when shopping online		a) 22 b) 54 c) 11 d) 9 e) 8	a) 21% b) 52% c) 10% d) 9% e) 8%
Source	The speed at which I can navigate the website is important to me		a) 32 b) 50 c) 15 d) 4 e) 3	a) 31% b) 48% c) 14% d) 4% e) 3%

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Part 3. Importance of risk reduction methods				
Q6: How important are the following aspects to you when purchasing on the internet?				
Risk Reduction Method	Statement	Scale	Frequency	Percentage
Brand reputation	Choosing a well-known/popular online store	a) Very important b) Important c) No opinion d) Less important e) Not important at all	a) 27 b) 51 c) 11 d) 12 e) 3	a) 26% b) 49% c) 11% d) 11% e) 3%
Brand loyalty	Purchasing from the same store you've purchased from before		a) 22 b) 58 c) 14 d) 9 e) 1	a) 21% b) 56% c) 13% d) 9% e) 1%
Product information	Choosing a product that has a lot of information available about it		a) 49 b) 45 c) 5 d) 5 e) 0	a) 47% b) 43% c) 5% d) 5% e) 0%
Money-back guarantee	Making sure that there is some form of money-back guarantee available		a) 43 b) 36 c) 16 d) 8 e) 1	a) 41% b) 35% c) 15% d) 8% e) 1%
Exchange policy	Making sure that the product can be exchanged		a) 36 b) 41 c) 17 d) 9 e) 3	a) 33% b) 39% c) 16% d) 9% e) 3%
Existence of local retailer	Choosing a brand/store that has a physical local retailer		a) 8 b) 24 c) 26 d) 33 e) 13	a) 8% b) 23% c) 25% d) 32% e) 12%
Communication with the vendor	Purchasing from a site that has customer service (phone, email)		a) 30 b) 44 c) 17 d) 10 e) 3	a) 29% b) 42% c) 16% d) 10% e) 3%

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Appendix 2 continued

Risk Reduction Method	Statement	Scale	Frequency	Percentage
Delivery tracking	Making sure that delivery tracking is provided	a) Very important b) Important c) No opinion d) Less important e) Not important at all	a) 22 b) 43 c) 22 d) 12 e) 5	a) 21% b) 41% c) 21% d) 12% e) 5%
Privacy policy	The website has a clear privacy policy		a) 27 b) 33 c) 25 d) 14 e) 5	a) 26% b) 32% c) 24% d) 13% e) 5%
Privacy seals	The site has visible privacy seals (example below)		a) 20 b) 30 c) 30 d) 15 e) 9	a) 19% b) 29% c) 29% d) 14% e) 9%
Customer testimonies	The site has other customer's reviews/testimonies		a) 38 b) 42 c) 16 d) 6 e) 2	a) 37% b) 40% c) 15% d) 6% e) 2%
Website functionality	Making sure that the website functions properly		a) 44 b) 45 c) 7 d) 6 e) 2	a) 47% b) 43% c) 5% d) 5% e) 0%

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Appendix 2 continued

Questions	Answers	Frequency	Percentage
Part 4. Demographic questions			
Q7: What is your age?	a) 19-29 b) 30-39 c) 40-49 d) 50+	a) 63 b) 8 c) 10 d) 23	a) 60% b) 8% c) 10% d) 22%
Q8: And your gender?	a) Woman b) Man	a) 54 b) 50	a) 52% b) 48%
Q9: Last, but not least. Where are you from? (open-ended question)	a) Estonia b) Spain c) USA d) Finland e) Canada f) UK g) Hungary h) Austria i) Ireland j) Belgium k) Germany l) Peru m) Italy n) Nigeria o) Russia p) Ukraine q) Wales r) South Korea s) Mexico t) Syria	a) 37 b) 19 c) 17 d) 7 e) 6 f) 3 g) 2 h) 1 i) 1 j) 1 k) 1 l) 1 m) 1 n) 1 o) 1 p) 1 q) 1 r) 1 s) 1 t) 1	a) 36% b) 18% c) 16% d) 7% e) 6% f) 3% g) 2% h) 1% i) 1% j) 1% k) 1% l) 1% m) 1% n) 1% o) 1% p) 1% q) 1% r) 1% s) 1% t) 1%

Source: Compiled by the author