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Student,  
Nguyen Thi Thoa

## ABSTRACT

Financial technology (known as Fintech) is one of the most prominent trends in the global industrial revolution 4.0. It refers to innovative technology that aims to enhance and automate the delivery and usage of financial services. As a result of the effects of the covid 19 epidemic, particularly the social distancing policy and the demand for digital connectedness, the formation of fintech firms providing various types of services has expanded rapidly (Feyen et al., 2021). This financial industry innovation provides numerous positive effects, but it also contains considerable risks for customers, suppliers, and intermediaries, especially cyber security risks. Based on prior research subjects such as perceived risk variables influencing intention to use Fintech (Tang et al., 2020) and the connection between risk perception and preventative behavior (Alqahtani et al., 2021; van Schaik et al., 2017), this study will focus on two main goals. The first objective is to discover and recognize factors that influence consumers' perceptions of possible hazards when using fintech. Then, we will examine the effect of risk perception on consumer precautionary behavior regarding information security. Therefore, investors and founders of Fintech software may better understand their customers' requirements and develop more security solutions. The findings indicate that knowledge, affect, and trust are the primary determinants influencing the risk perception of Fintech consumers in Vietnam and Norway. Nevertheless, there exists a disparity in the level of their impact when contrasting the two nations. Furthermore, it was observed that risk perception served as a predictor of Fintech users' precautionary behavior. The research model's reliability and validity are ensured through the utilization of SmartPLS software for the analysis of survey data.

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## Chapter 1: INTRODUCTION

The ubiquitous devices that individuals utilize on a daily basis, such as smartphones, computers, or smartwatches are all products of technological advancements. These technological items have significantly created convenience and enhanced the ease of our daily lives. For example: Communication barriers posed by distance have been overcome with telephones, while online shopping has enabled rapid purchase of products from various parts of the world. Additionally, the online platform Google has made it possible to obtain a vast range of information across various fields in a few seconds. Technology can be described as the body of knowledge that deals with the innovation, development, and use of technological methods, as well as their interactions with our life, society, and the environment (Kasemsap, 2016). In other words, technology is the use of scientific knowledge to attain a certain objective or to develop applications that are employed in industry or in daily life. Several studies have been conducted to discuss and assess the substantial influence of technology on all aspects of life: educational (Raja and Nagasubramani, 2018), health (Agbo et al., 2019), and political issues (Pierskalla and Hollenbach, 2013)... In particular, the advent of the internet and the popularity of smartphones have contributed to the change in financial habits of most people, shifting from traditional finance to digital finance. This transformation is also known as the fintech trend, a term that combines "financial" with "technology", which has generated a lot of discussion in the industry recently (Leong, 2018; Palmié et al., 2020; Saksonova & Kuzmina-Merlino, 2017).

**FinTech** is defined as “technologically enabled financial innovations that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and on the provision of financial services.” (The Financial Stability Board, 2017). According to an EY (2019) survey, worldwide FinTech adoption increased quicker than forecast, rising from 52% in 2017 to 64% in 2019. Moreover, as a result of the effects of the covid 19 epidemic, particularly the social distancing policy and the demand for digital connectedness, the formation of fintech firms providing various types of services has expanded rapidly (Feyen et al., 2021). Common Fintech examples that may be relatable to most readers include innovations like E-wallet, crypto currencies, lending clubs and many others. E-wallet is a type of account/card that clients may use to store their personal information and to make quick and easy digital purchases or sales of products. To make payments, an E-wallet must be connected to the user's bank account. Secondly, crypto currency refers to any kind of money that exists digitally or electronically and employs cryptography to safeguard transactions is known as cryptocurrency. Cryptocurrencies use a decentralized mechanism to track transactions and create new units rather than a central authority to issue or regulate them. Third, lending clubs refer to a peer-to-peer lending service platform with pioneering financial technology applications in the US. Accordingly, this application connects those who have idle capital to lend and those who need money to solve financial problems without having to go through a bank or an intermediary organization. Lastly, services like Kickstarter, TransferWise and Robinhood...



In addition to the undeniable advantages and enormous significance of transforming the existing financial services industry, Fintech applications confront several possible hazards, such as: underestimation of creditworthiness, market risk incompliance, fraud detection, and cyber-attacks (Giudici, 2018). Therefore, in a few research, the authors studied and quantified the influence of both aspects: benefit and risk perception on customers' adoption of FinTech (Ryu, 2018; Nawayseh, 2020; Ali, 2021). Most of these studies agree that **risk perception** has a significant impact on customers' adoption of Fintech. However, none of them have concentrated on the elements that influence and determine how individuals perceive risks. This literature gap will be addressed in this paper by proposing and testing some main factors affecting FinTech user's risk perception.

According to some empirical surveys, **Cyber security**, a part of Information security, needs to be always considered as the greatest issue and the top priority for protection of any fintech companies. It consists of resources, processes, and structures used to protect systems, networks, programs, devices, and data from cyber-attacks. Sensitive customer information, especially financial information/transaction, stored on fintech applications is constantly threatened by hackers. The Ponemon Institute 2019 Study pointed out that approximately \$18.5 million is spent annually by banks and financial companies to combat cybercrime. Moreover, the annual cost of hacker attacks is up to \$18.3 million per financial services provider. When considering means to overcome this main obstacle to the development of Fintech apps, Van Schaik (2017) suggested one aspect that requires deliberation is the nature of the hazards and the requisite countermeasures. In addition, the author also highlighted the importance of investigating users' engagement with these apps and their perceptions of risk. Because, from the user's point of view, the risks they may face make the use of Fintech become unreliable and uncertain (Tang, 2020). Therefore, understanding their awareness of information risk help developers know how to remove barriers and promote their intention of using Fintech.

To sum up, cybersecurity is a major challenge for fintech growth, and users' risk perception of cybersecurity is recognized as a crucial factor impacting their fintech usage and precautionary behavior. Risk perception research may assist producers in improving product security to satisfy users, promoting their fintech adoption and securing personal information. However, there has been relatively few research on this issue. Therefore, this paper aims to discover factors that influence consumers' perceptions of possible hazards when using fintech and to examine the effect of risk perception on consumer precautionary behavior regarding information security. Unlike previous studies on the matter, Knowledge, Trust, and Affect are the three key factors explored in this paper to evaluate their significant effect on how risk is perceived. Besides, Van Schaik (2017) argued that "risk perceptions play a fundamental role in models as predictors of precautionary behavior".

Therefore, this research will propose a theoretical model to answer for the following hypotheses:

- Hypothesis 1: *Knowledge* has a significant impact on how users perceive information risk when using Fintech.
- Hypothesis 2: *Affect* has a significant impact on how users perceive information risk when using Fintech.
- Hypothesis 3: *Trust* has a significant impact on how users perceive information risk when using Fintech.
- Hypothesis 4: *Users' perception* about information security risk when using Fintech can be considered as predictors of *their precautionary behavior*.

In additions, the comparison between Norway and Vietnam is one of the study's expansion points. Regarding economic trends and technological application patterns, Norway is among the top developed nations. This country always ranks at the top in Europe in terms of use of internet banking, and robots perform tasks such as customer contact and processing of loan applications. Cash usage is low, and almost four in five person-to-person payments are made using Vipps mobile payment services. Vietnam, on the other hand, is an emerging economy that is growing rapidly. Only recently have financial services like online banking and e-wallets become extensively used in this cash-dominated society. Most daily financial transactions still involve cash. The degrees of risk perception and acceptance may fluctuate between users in Vietnam and Norway due to changes in knowledge, trust, and affect, which in turn may result in variations in their defensive behavior. This comparison may be extremely helpful to worldwide developers in better understanding their customer segments and improving their approaches for each market.

In the next section (section 2- Literature review), the theoretical bases and evidence based on previous studies will be presented to build up and strengthen the hypotheses. Then, the method of measurement and analysis of the research model will be clearly explained in section 3- Research methodology. Analytical results obtained from data processing through software will be presented briefly in Section 4 – Technical data analysis and Findings. After that, the main results of the study related to the significance of the hypothesis will be presented in detail in Section 5 – Discussions and Conclusions. The last section, Section 6- Research contributions, limitations and suggestions will outline the role and contribution of this study to the relevant field, limitations in the implementation process and suggestions for future research.

## Chapter 2: LITERATURE REVIEW

A literature review is commonly regarded as an examination of academic sources pertaining to a specific topic. This section presents a comprehensive summary of existing literature that is crucial for the author to identify relevant concepts, methodologies, and research gaps that can subsequently be adopted in the paper. Firstly, in section 2.1, the present paper will provide insights into the implementation of financial technology (denoted as Fintech) and its associated hazards-cyber security risks. The objective is to enable the reader to understand the context, significance, and realistic implications of the research. Secondly, the following sections will be formulated in accordance with the research aim, which is to investigate the determinants that influence risk perception and the potential impact of risk perception on preventive behavior. Therefore, information related to risk perception (section 2.2), knowledge (section 2.3), affect (section 2.4), trust (section 2.5), and precautionary behavior (section 2.6) will be presented respectively. Then, drawing upon findings from prior research, the author will formulate research hypotheses pertaining to the relationship among various factors mentioned above.

### 2.1. Fintech and Cyber security risk

FinTech is a term that denotes the application of digital technology solutions to revolutionize financial institutions, thereby representing an innovative approach to financial services. The utilization of financial technology provides numerous advantages to both individuals and enterprises. Firstly, Fintech offers significant benefits in terms of enhancing the expediency and efficiency of financial transactions. The emergence of Fintech has facilitated the seamless transfer of funds, payment of bills, initiation of bank account opening procedures, and provision of loans. Secondly, the combination of Artificial Intelligence and Fintech is facilitating the emergence of numerous automated customer service alternatives. Automated customer servicing can be achieved through various means, including smart chatbots, virtual assistants, advisors, and personalized user interfaces. Thus, Fintech has the potential to decrease transaction expenses and enhance the quality of customer service, thereby leading to increased customer retention rates. Financial institutions such as banks, stock exchanges, and hedge funds can gain a competitive edge through the implementation of FinTech solutions. Furthermore, the utilization of fintech applications enhances financial transparency and facilitates financial management for both individuals and organizations, thereby mitigating potential risks associated with embezzlement, money laundering, and counterfeit currency. Finally, the implementation of fintech has been shown to enhance the competitiveness and diversification of the financial market. The growing number of Fintech firms offering customized and pioneering financial products and services that respond to the specific demands of customers can foster a more competitive and sustainable financial market. Subsequently, clients will be presented with a wider array of options and can select the financial products and services that are most compatible with their requirements.

Nevertheless, the complete achievement of the advantages offered by Fintech has been impeded by the restricted user base. The controversial issues surrounding fintech applications still elicit hesitancy among customers (Ryu, 2018). The potential hazards and drawbacks associated with FinTech appear to carry greater weight in the perception of consumers compared to its potential advantages (Abdul-Rahim et al., 2022). Cyber security risk is identified as one of the most challenges confronting the fintech industry. Cyber security risk relates to the potential loss of confidentiality, integrity, or availability of information, data, and system control (Stine et al., 2002). These risks have the potential to negatively impact organizational operations and assets, individuals, and the nation.

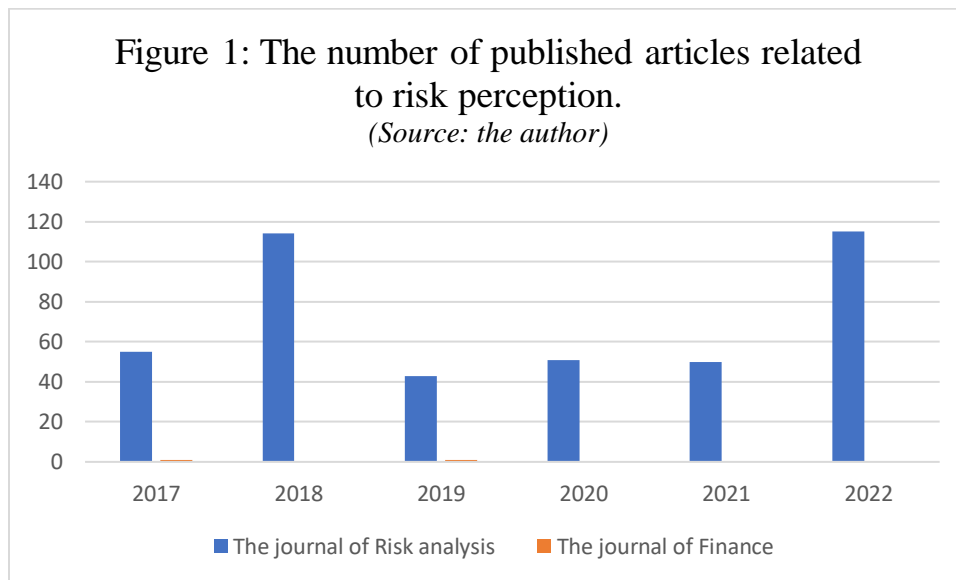
Several cyber threats that have been encountered by organizations in recent times comprise of malware, ransomware, phishing, stolen passwords, cyber fraud, and interruption of essential services (Gurdip et al., 2021). In the year 2021, numerous cyberattacks transpired globally, resulting in significant ramifications. One of the most notable ransomware attacks on record occurred against Kaseya Information Technology Company, located in the United States. The attack involved the use of ransomware to target a range of businesses that were availing the services of the company. The outcome of this attack was that an estimated number of 800 to 1,500 businesses across the globe were impacted. Besides, the incident involving the Stock Exchange of Robinhood Markets Inc, a financial services firm based in the United States, was an attempt to unlawfully obtain personal information, which impacted over 22 million users engaged in stock and foreign exchange trading.

This research concentrates on analyzing the behavior of individuals as fintech users; therefore, the most serious cyber danger they may encounter mentioned in this study is the stolen of their confidential information, which may result in significant financial loss. When consumers connect their bank accounts to insecure Fintech applications or click on fraudulent links, their data is easily compromised. As an example, a customer provides his or her bank account information on a Fintech platform that facilitates global transfers of money. The security infrastructure of the aforementioned application has been hacked, leading to the unauthorized access and theft of customer data, as well as the effortless misappropriation of funds from customer accounts.

According to the report of the World Bank group, there exists a positive correlation between the fintech activity index and the overall level of economic development of countries (Didier Brandao et al., 2022). In which, the index includes three different dimensions of fintech activity, namely the establishment and expansion of fintech firms through the provision of early-stage equity financing, the utilization of fintech credit and digital payments and the employment of mobile distribution channels for financial services. For instance, it is commonly observed that nations with higher income levels tend to exhibit superior rankings in terms of the aggregate fintech index as compared to those with middle- and low-income levels. This study aims to examine the aforementioned statement and explore the factors that may impact the degree of fintech adoption through the perspective of risk perception. Hence, a comparative analysis between Vietnam and Norway will be conducted to achieve this objective.

## 2.2. Risk perception

Since the global outbreak of the covid 19 epidemic, organizations in various industries, including the business, health, and education... have become increasingly concerned with risk-related issues. In which, risk perception is one of the most crucial aspects of risk management, helping the managerial decision-making process (show in Figure 1). Because Renn (2008) emphasized that human behavior is governed mostly by perception and not by facts or what risk analysts and scientists consider to be facts. However, this subject remains controversial and challenging for many scholars (Aven, 2021). In particular, the author stated that technical and solely quantitative methods for characterizing risks are insufficient to capture the complexity of individual risk perception. Besides, the variance in perception across individuals significantly challenges risk management decision-making, referring to the question of whose perceptions should be priority used to make decisions on risk.



Risk perception refers to the individual's evaluation and interpretation of potential hazards. It varies among individuals and groups due to multiple influencing factors. Hence, one of the primary research avenues concerning risk perception pertains to the identification of factors that account for differences in individuals' risk perceptions. These factors can include perceived benefits, trust, knowledge, personal values, and fairness (Aven, 2021). Furthermore, the extent of scholarly inquiry into risk perception within the realms of economics and finance remains considerably restricted (show in Figure 1). The acceptance of financial risks is contingent upon two primary factors: the perceived benefits and the perceived risks. Several authors argue that in numerous instances, the perceived risk factor holds greater significance than the perceived benefit factor. Consequently, this study aims to examine and identify the variables that impact the perception of cyber security risks among users of fintech services, with the objective of building

upon the prior research and addressing the existing research gaps. Subsequently, Fintech entrepreneurs and suppliers possess additional data regarding customers' risk perceptions, enabling them to enhance their offerings and tactics to encourage user adoption.

According to Johnson (1993), in risk perception research, knowledge about hazards plays a central but curious function. The author stated that “Knowledge is and should be important in risk perception”. Aven (2021) also wrote in his book that more information about a hazard may have a significant impact on the risk perception. However, in situations where knowledge about potential hazards is limited, trust and affective factors assume an essential part in explaining risk perception. In other words, risk perception is also influenced by trust and affect, which subsequently impacts the decision regarding acceptance or rejection. On the basis of these arguments, this research will analyze and measure the impact of three factors: knowledge, affect and trust on fintech users about the cyber risk perception (the possibility of stolen data and property loss).

### **2.3. Knowledge**

The term "knowledge" refers to comprehension or information relating to a particular topic that is acquired through personal experience or academic inquiry and may be known by an individual or a collective group. Regarding the definition of risk, it is considered that knowledge may be conceptualized as justified belief, which is built on various components such as data, information, modeling, testing and argumentation... As previously stated, the influence of knowledge on risk perception is a curious subject in research studies, despite its undeniable impact. The variability in the impact of knowledge on risk perception (the direction and magnitude of its effect) is contingent upon the strength of knowledge and the particular risk scenario under consideration. According to Aven (2021), the provision of compelling evidence indicating that a drug is carcinogenic can significantly enhance the perceived risk associated with its use. In certain instances, the assessment of risk is predominantly influenced by values as opposed to knowledge, particularly within the nuclear sector. The public's risk perception of the nuclear industry is influenced by their attitudes towards it and their assessment of the trade-offs between risks and benefits. Therefore, it is unlikely that knowledge will significantly alter risk perception.

The analysis of the influence of knowledge on risk perception has been extensively examined across various research domains. The authors, Sjöberg & Drottz-Sjöberg (1991), conducted a study in the domain of nuclear power plants, investigating the extent of understanding regarding radiation and its correlation with perceived risk. The study's results indicated a negative correlation between knowledge and perceived job risk as well as nuclear risk. The study found a negative correlation between perceived risk and radiation knowledge, even among radiation protection personnel who underwent a specialized test requiring advanced knowledge. Likewise, in the field of financial research, individuals with a greater understanding of financial concepts tend to exhibit a more positive perception of risk, resulting in a favorable attitude towards investment and a greater inclination to engage in financial behavior (Asad Khan et al., 2021). However, some research

supported a positive impact of knowledge on perceived risk. For example, the study conducted by Aksit et al., (2018) has tested the significance of climate change knowledge in forecasting the risk perception of students. The finding reveals that a substantial number of college students hold a heightened sense of anxiety regarding the issue of climate change, despite possessing a limited comprehension of its underlying scientific knowledge about climate change.

To verify the findings of prior studies, the present study proposes that a proportional relationship exists between users' level of knowledge regarding Fintech applications and their levels of fear and concern regarding potential risks associated with such applications. In other words, individuals having more knowledge in the domains of Fintech and cybersecurity exhibit a higher level of risk perception.

Hypothesis 1: *Knowledge* has a significant impact on how users perceive information risk when using Fintech.

#### **2.4. Affect**

The term "affect" is frequently utilized as a comprehensive term to encompass all aspects related to emotions, specifically an individual's fundamental subjective experience (Slovic & Peters, 2006). Affect typically refers to the specific quality of "goodness" or "badness" experienced as a feeling state, whereas emotions are typically more intense, shorter in duration, and more bodily character. Numerous scholars have posited that affect, which plays a central and fundamental role in shaping behavior, is regarded as a significant determinant impacting individuals' risk perception and acceptance (Slovic & Peters, 2006; Sobkow et al., 2016). In particular, the positive affect elicited by a particular experience tends to facilitate behaviors that individuals expect will result in the recurrence of that affective state. Conversely, negative feelings can serve as a driving force for individuals to take action in order to avoid experiencing them again. The heuristic affect, as commonly observed in risk literature, refers to the initial emotions that an individual experiences when confronted with a danger or hazard. The reliance on heuristic affect, which are mental shortcuts, to subjectively assess a hazard is considered an important factor in predicting risk perception. However, this approach may result in the amplification or attenuation of risk. Consequently, there is a need for research to investigate the influence of effect on risk perception in various domains and diverse risk contexts.

According to (Ferrer & Klein, 2015), when making decisions related to health, individuals are required to navigate various options by considering the potential risks and benefits associated with each choice. And risk perception is frequently regarded as a focal element in the effort to modify health behaviors. The authors also stated that the formation of risk perceptions can be influenced by general affect. For instance, distress is positively correlated with heightened risk perceptions. Individuals who experience depression may exhibit a greater tendency to modify their risk perception assessments in reaction to health-related information compared to those who do

not experience depression. Several studies indicate that negative emotions may exert a more potent influence on risk perception compared to positive emotions. For example, according to the flood-related risk perception research conducted by (Altarawneh et al., 2018), individuals who exhibit heightened negative emotions towards the risk of flooding are more likely to perceive a higher probability of occurrence and greater extent of damages or consequences. In other words, high intense negative emotions trigger pessimistic risk perceptions. By contrast, positive emotions elicit optimistic evaluations of risk. Based on these arguments, this paper will propose the hypothesis as follows:

Hypothesis 2: *Affect* has a significant impact on how users perceive information risk when using Fintech.

In which, the “affect” factor being measured in this study pertains to either: (i) the positive emotional responses that are linked to users' past experiences of cyber security risks; or (ii) the immediate sentiments of users associated with the utilization of Fintech.

## **2.5. Trust**

According to Aven (2021), individuals tend to heavily depend on trust as a basis for their evaluations of hazards or risks, especially when they possess limited information regarding said hazards or risks. Likewise, Mcknight and Chervany (2000) posited that trust plays an essential part in situations where there is a presence of risk, uncertainty, or interdependence. In contrast to the usual hazards, such as vehicular collisions and tobacco use, laypeople frequently possess insufficient comprehension and awareness regarding certain categories of hazards associated with science and technology, such as the phenomenon of climate change, nuclear energy, genetic engineering, and emerging diseases (Siegrist, 2021). Hence, the assessment of cognitive capacity and risk acceptance cannot rely exclusively on knowledge, but trust ought to be regarded as a crucial analytical element. Trust is widely regarded as a crucial factor in driving customer adoption of Technological applications, particularly within the realm of Fintech. In contrast to conventional financial methods, the majority of fintech applications are constructed on network platforms and incorporate AI services to facilitate customer support. Consequently, this may engender heightened skepticism among customers. Users may experience ambiguity regarding the absence of a guarantor or responsible party in the event of an accident or incident.

There appears to be a negative correlation between general trust and risk perceptions in relation to various hazards (Siegrist et al., 2006). Individuals who exhibit a high degree of social trust towards unfamiliar individuals tend to perceive lower levels of risk in relation to diverse technological and societal hazards, in contrast to those who display a low level of social trust. The above perspective is further supported and substantiated in the research of (Siegrist et al., 2021) concerning the perception risks associated with covid 19 pandemic. Individuals exhibiting high



levels of general trust tend to associate lower levels of risk with COVID-19, in contrast to those with lower levels of general trust. The present study posits that trust exerts a significant and adverse/negative impact on the cyber risk perception of Fintech users. Individuals who exhibit a proclivity for placing trust in others and possess a heightened level of confidence in the security measures employed by applications are likely to present a comparatively lower degree of risk perception regarding the potentiality of information and property losing while utilizing Fintech.

Hypothesis 3: *Trust* has a significant impact on how users perceive information risk when using Fintech.

## **2.6. Precautionary behavior**

It is commonly suggested that individuals are more inclined to engage in precautionary behavior when they perceive both a high level of severity and vulnerability (Van Der Pligt, 1998). Additionally, preventive behavior should be implemented when the implementation cost is substantially less than the benefit it provides. Numerous studies have investigated the significant relationship between risk perception and preventive behaviors. However, their interaction is quite complex because it can occur in both positive and negative dimensions. In some instances, increased awareness of health hazards increases the patient's intention to take preventative measures. However, in the other cases, perceived risk is found to be negatively associated with precautionary behavior. For example, Mermelstein and Riesenber (1992) investigated adolescents' perceptions of skin cancer risk factors. They explored the role of perceived risk and discovered some findings for the predicted relationship between perceived susceptibility to skin cancer and precautionary intentions. Knowledge and awareness of the risk of skin cancer were substantially increased after a school session, but it did not influence the participants' intention to engage in protective behavior.

According to Van Schaik et al., (2018), risk perception positively predicted precautionary behavior. The likelihood that Facebook users had chosen secure privacy and security settings increased in proportion to the perceived risk associated with Facebook's security and privacy risks. This viewpoint is also supported by Iorfa et al. (2020)'s covid 19 study, which found that higher levels of risk perception predicted greater participation in precautionary behaviors. Based on these arguments, this research paper will propose the hypothesis that the greater the perceived cyber security risk among fintech users, the more likely they are to participate and employ preventative measures.

Hypothesis 4: *Users' perception* about information security risk when using Fintech can be considered as predictors of *their precautionary behavior*.

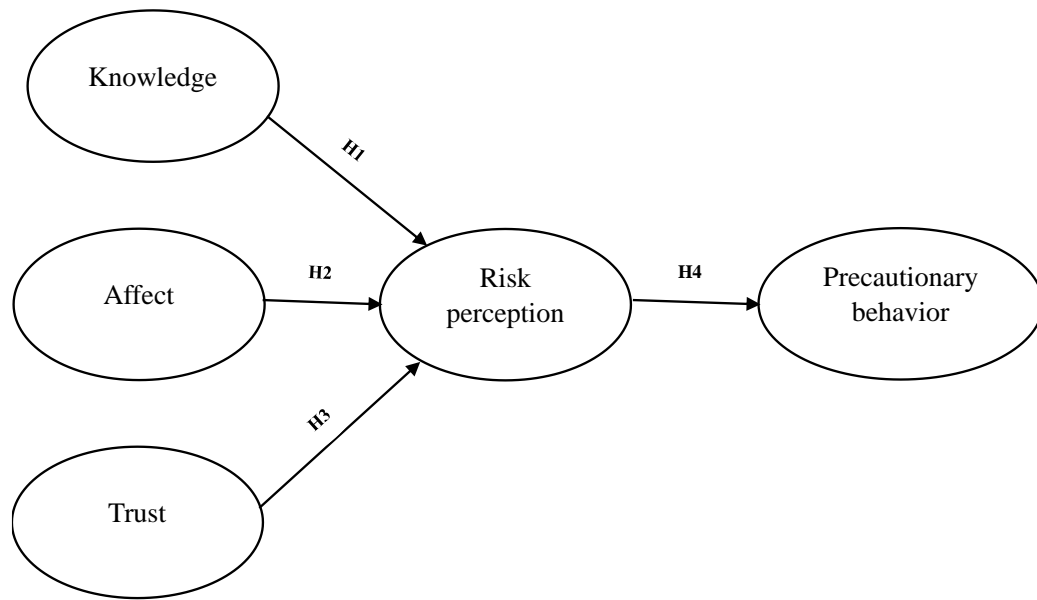


Figure 2: The theoretical model

Figure 2 shows the research model, which is constructed in accordance with the four assumptions (H1, H2, H3, H4) mentioned above. In which, three independent variables that have the potential to influence risk perception are knowledge, affect, and trust. And risk perception can impact the precautionary behavior of Fintech users.

## Chapter 3: RESEARCH METHODOLOGY

In this section, four subsections will detail the research methodologies used to assess the model and hypothesis. Section 3.1 will explain why the quantitative analysis of data through survey was chosen for this article. In order to obtain the most accurate data, the construction and assessment of the survey sample (questionnaire) will be discussed in Section 3.2. The process of data collection and the number of samples used in the subsequent analysis will be briefly described in Section 3.3. Section 3.4 will provide a data analysis plan following SmartPLS software processing.

### 3.1. Survey as a quantitative research method

In this study, quantitative research method is used to quantify the problem by way of generating numerical data. The selection of an appropriate analysis method should be based on the research objectives and direction of the author, as both quantitative and qualitative methods have their own set of advantages and limitations (Almeida et al., 2017). Qualitative research typically prioritizes an in-depth understanding of a particular topic over numerical representation. The objective of this approach is to generate insights and illustrations that facilitate comprehension of all aspects of the issue under assessment. Hence, qualitative approach is frequently employed in research endeavors that focus on understanding and explaining the dynamics of society that are beyond the scope of empirical observation. Quantitative research, in contrast, emphasizes objectivity and focuses on problem-solving through data collection for analysis and measurement. Most of the quantitative research is used to prove or disprove a predetermined hypothesis the researcher may have derived from qualitative studies. This method enables the generalization of results from a sample group to the entire population. Based on these features, it is obvious that the selection of quantitative methodology for this study is reasonable. Initially, the primary purpose of the study is to assess the hypotheses developed from the perspectives of previous researchers. Second, the study seeks to compare the differences between Vietnam and Norway, necessitating quantitative results that are objective and capable of representing an entire population.

The survey refers to via a set of questions designed to find out and prove relationships between variables. The most noticeable characteristics of the survey are that data of multiple cases are collected at one point of time (De vaus, 2001; Bryman and Bell, 2007). One of the most advantages of the survey is its reasonable costs to collect data within a relatively short period of time. However, if the questionnaire is not carefully designed, the misunderstanding of respondent can be a major problem (Johnson and Turner, 2007). The survey consists of different stages. The first phase is to state the problems that will be examined by the studies. At this stage, the main concepts of the study are clarified before hypotheses are developed and conceptual framework is built. Secondly, a pilot test is advisable to ensure the questionnaire is of the best quality concerning its content, its length, and its understandability to target respondents. Thirdly, this is followed by sample plan that allows the researcher to identify a minimum sample size for the study before the

questionnaire is officially delivered on a large scale. According to Hair et al. (2014) the minimum sample size is to have at least five times as many observations as the number of items in questionnaire to be analyzed. The next phase is to clean the data before certain techniques or methods of data analysis are implemented. Then, research findings are drawn. Importantly, the credibility of research findings is significantly influenced by two vital aspects of survey design namely reliability and validity.

### 3.2. Questionnaire design and Pilot test

#### *Definition of items*

The hypothesis structure of this study consists of 5 dimensions, and the variables of each dimension are defined and operated according to relevant literature (as shown in chapter 2). The questionnaire items of variables are appropriately modified regarding cyber security risks when using Fintech. Based on the general concept, this study proposes specific concepts for each factor, which will be used to construct related survey questions, described in table 1 below.

Table 1: The definition of variables

Research variables	Conceptual definitions	
	General definition	Specific definition (in this research)
Knowledge	The term "knowledge" refers to comprehension or information relating to a particular topic that is acquired through personal experience or academic inquiry and may be known by an individual or a collective group.	Knowledge refers to the surveyors' awareness of Fintech and network security issues, particularly regarding regular applications they use, such as internet banking and e-wallets. This knowledge is derived from access to marketing and instructional resources, explanatory materials related to the Fintech applications, and practical experience gained from their usage.
Affect	Affect typically refers to the specific quality of "goodness" or "badness" experienced as a feeling state, whereas emotions are typically more intense, shorter in duration, and more bodily character.	Affect refers to the good emotions and experiences that occur when utilizing Fintech. This factor is formed based on their actual feelings and experiences when using such as safety, convenience...It is also expressed via the level of users' interest and excitement when using Fintech compared to traditional financial services.

Trust	General trust is the belief that other people can be relied on.	Trust pertains to the confidence of users in the security of Fintech applications, as well as their belief that associated entities, such as founders and legal organizations, will safeguard users' interests in the event of potential risks.
Risk perception	Risk perception refers to the individual's evaluation and interpretation of potential hazards.	Risk perception pertains to the awareness on cybersecurity risks among Fintech users, that includes their assessments of the probability of a risk event, their evaluations of the gravity of the risk, and their deliberations on benefit-risk comparison.
Precautionary behavior	Precautionary behavior refers to a series of behavior that reduce the probability and minimize the consequences of potential risks.	Precautionary behavior can be observed through actions aimed at mitigating risks and reducing their impact. These actions may include actively seeking to enhance users' knowledge of Fintech and cyber security; expressing greater caution when utilizing applications; and avoiding sharing sensitive information. It is also suggested to seek out comments and reviews pertaining to the Fintech application before using.

***Designing questionnaire***

The questionnaire was designed to be simple for the respondents easily to understand. It is recommended that “the shorter the questionnaire, and the simpler the questions, the more likely that people will reply to it”. Moreover, the questionnaire was designed in both English and Vietnamese.

The questionnaire consists of two sections: Demographic information of respondents; and Factors affecting users’ risk perception when using Fintech. All question items were designed to ensure clear and understandable to respondents.

- ❖ Section 1: Demographic information of respondent

This section is designed to obtain basic background information of respondents, which consists of age, gender, education level, online shopping frequency (during last year) and social networks usage intensity.

Table 2: Demographic information of respondents

<b>Age</b>	20-30 years old
	30-40 years old
	40-50 years old
<b>Gender</b>	Male
	Female
<b>Educational level</b>	High school
	University
	Postgraduate (MSc/PhD...)
<b>Frequency of online social network usage</b>	Rarely (<1hour/day)
	Often (<1-3hours/day)
	Usually (3-5hours/day)
	Always (>5hours/day)
<b>Online shopping frequency</b>	Rarely (0-2 times/week)
	Often (2-5 times/week)
	Usually (5-10 times/week)
	Always (>10 times/week)

❖ Section 2:

The second section contains 18 measuring items of 5 constructs including: Knowledge, Trust, Affect, Risk perception, Precautionary behavior.

Each item will be measured on a five-point Likert scale.

Table 3: Five-point Likert scale

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Strongly disagree	Disagree	Neither agree nor disagree (Medium)	Agree	Strongly agree

Table 4: Measuring items for questionnaire

<b>Construct</b>	<b>Label</b>	<b>Item</b>
<b>Knowledge</b>	KNO1	You are familiar with using financial technology software like e-wallets and online banking.
	KNO2	You frequently hear and read information about financial technology on TV and in publications.
	KNO3	You are aware of how financial technology applications may be used to steal personal assets and information.
	KNO4	You have enough understanding and knowledge about the financial technology applications (e-wallet, crypto currency...) you utilize.
<b>Affect</b>	AFF1	You are excited to use financial technology apps (online purchases and payments, international money transfer...) rather than traditional financial services.
	AFF2	You like using financial technology applications because they are very convenient to shopping online, money transfer...
	AFF3	When everyone around you uses financial technology apps, it makes you feel more comfortable and secure.
	AFF4	When you use financial technology apps, you do not feel insecure and worried.
<b>Trust</b>	TRU1	You believe that the financial technology apps you utilize are safe and secure.
	TRU2	You trust everyone around you, even people you have just met.
	TRU3	You believe that the authorities and the manufacturer will be responsible for protecting and compensating when a cyber risk occurs.
<b>Risk perception</b>	RIS1	How do you think about this statement? "The possibility of cyber security risks when using financial technology apps is huge."
	RIS2	How do you think about this statement? "Cyber security risks when using financial technology apps have serious consequences."
	RIS3	How do you think about this statement? "The risk of cyber security (losing information and assets) when using fintech is higher than its benefit (low transaction fee, convenience...)."
<b>Precautionary behavior</b>	BEH1	You learn more about cyber security methods before using a financial technology product.
	BEH2	You increase your vigilance with some cases of cyber-attacks, especially those that have happened to relatives and friends.
	BEH3	You avoid providing sensitive information when using untrusted financial technology applications.
	BEH4	You check the application security and seek user feedback on it before using.

### ***Pilot test***

One of the main factors in conducting surveys and other data gathering methods is efficiency. It is important to utilize money, time and effort in the most efficient way possible to achieve success in performing surveys, especially those that require a large number of respondents. To promote efficiency in conducting surveys, pilot questionnaires usually is performed by researchers. A pilot survey is a strategy used to test the questionnaire using a smaller sample compared to the planned sample size (Sarah Mae Sincero, 2012). The survey was sent to 25 people (15 Vietnamese and 10 Norwegian) who are at a high level of education to consider if the content was understandable and clear. They had comments about using vocabulary consistently and some questions that made them confused. All problems were corrected before sending the final questionnaire to the participants. As such, the quality of the questionnaire is improved through the received feedback, especially when the feedback comes from potential respondents (Norman et al., 2004; Ronal et al., 2005).

### **3.3. Sample size and Data collection**

Sample size is a count of individual samples or observations in any statistical setting, such as experiment or survey. The choice of sample size is a critical determination for a successful project. A too small sample makes unreliable results, while an overly large sample requires a good deal of time and resources (Zamboni, 2018). And Hair et al. (2014) stated that each variable needs at least 5 respondents. The data collection from Vietnam is conducted entirely online; the survey is presented as a Google form, and the link to the survey is sent to all involved. In Norway, the survey was conducted through in-person interviews and discussions. After the survey was conducted, 160 results from the Vietnamese side and 140 responses from the Norwegian side were recorded and utilized.

### **3.4. Analyzing data plan**

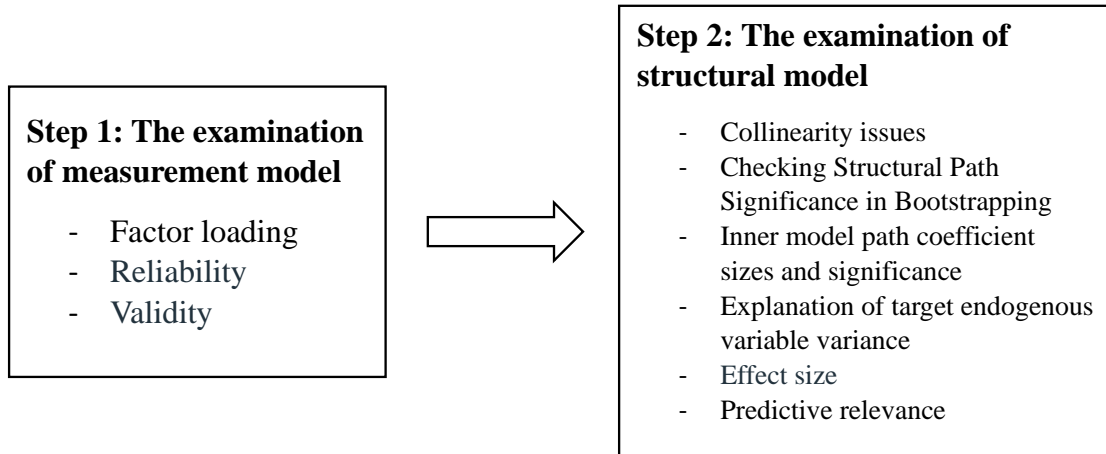
#### ***3.4.1. Using SmartPLS software to analyze the collected data***

SmartPLS, developed by Ringle, Wende & Will (2005), is one of the prominent software applications for Partial Least Squares Structural Equation modeling (PLS-SEM). As a result of its high applicability and assurance of accuracy and dependability, the Software has been widely utilized in research in a variety of disciplines since its launch. Moreover, some authors claim that PLS-SEM is ideal for case studies with limited data and little supporting theory (Wong, 2013; Bido, 2014). Thus, in order to address the constraints posed by the data sample and theoretical framework, the present study will employ the PLS-SEM analytical approach using smartPLS 3.0 software. After completion of data processing and software modeling, the research findings will



be subjected to a comprehensive analysis and evaluation based on various factors, as outlined below:

Figure 3: The process of analyzing PLS-SEM results



In addition, prior to testing the research model and hypothesis, a descriptive statistical analysis will be conducted to demonstrate the correlation level between the two groups of survey participants: Vietnamese and Norwegian.

### ***3.4.2. Testing research model and hypothesis based on the key indicators***

When reporting a measurement model, the initial aspect that is typically observed is the factor loading. This index shows the correlation coefficient for the variable and factor. In SmartPLS, factor loading is essentially the square root of the absolute value of R square of the linear regression from the latent variable to the observed factor. In the SEM approach, as a rule of thumb, 0.7 or higher factor loading represents that the factor extracts sufficient variance from that variable (Hair et al., 2014). It means that the latent variable can explain at least 50% of the variation of the observed item. In case the loading factor is less than 0.7, deleting item should be considered. Apart from factor loading, the reliability and validity of the construct will be assessed in the measurement model. Measurement reliability refers to the consistency of responses to a set of questions designed to measure a given concept (Vaske, 2008). And two common indicators used to measure reliability are Cronbach's Alpha and Composite Reliability (CR). Cronbach (1951) discovered and formulated an index of measurement known as Alpha, which is widely recognized as a gauge of "internal consistency". According to Tavakol and Dennick (2011), internal consistency is related to the degree to which the items within a given test or scale are indicative of the same underlying concept or construct. Consequently, it is also recognized as the interconnectedness of the components within the assessment. Some researchers require a cutoff of

0.80 for a “good scale,” while others are as lenient as 0.60. This study will apply the most popular rule of alpha value according to George and Marllery, (1999): the value of Cronbach’s alpha is acceptable when it is greater than 0.7. However, this indicator “is very sensitive to the number of variables in each construct” (Bido, 2014). Therefore, Composite Reliability (CR) is a commonly favored measure over Cronbach's Alpha by a significant number of scholars. To be considered satisfactory, CR value needs to be from 0.7 to 0.9 (Hair et al., 2014). And higher than 0.95 can be considered as big problem because it indicates that the items are redundant, thereby reducing construct validity ((Hair et al., 2019). In addition, reliability values of 0.95 or greater imply the possibility of undesirable response patterns (e.g., straight lining), resulting in inflated correlations between the error terms of the indicators.

After guaranteeing the reliability, the validity is examined through two aspects: convergence and discriminant. The first aspect to examine the validity is the convergent validity acquired through the observations of the Average Variance Extracted (AVE). A measurement scale can be considered to have attained convergent validity if its AVE is greater than 0.5 (Fornell and Larcker, 1981). It means that, on average, the latent variable can explain at least 50% of the variation of each observed item. The next step is to assess the discriminant. Discriminant value indicates the distinctiveness of a construct when compared with other constructs in the model. The traditional approach to assessing discriminability is to use the square root of the index AVE. Fornell and Larcker (1981) proposed that discriminability is guaranteed when the square root of the AVE for each latent variable is higher than the correlations among the latent variables. However, Henseler et al. (2015) showed that the Fornell-Larcker criterion performs poorly, especially when indicator loadings on a construct differ marginally. Therefore, the author devised a more accurate assessment method through an index, known as HTMT, to replace the inaccuracies of this traditional method. When the HTMT index is below 0.85 (for more conservative) and 0.90 (for more liberal assessments), discriminant value between two latent variables is guaranteed (Roemer et al., 2021).

After considering and measuring all the indicators listed above to ensure the quality of the research model, the structural model analysis and hypothesis testing can be conducted. Firstly, consideration of the problem of multicollinearity, as measured by the VIF index, is an essential aspect of structural model evaluation. This index is separated into inner VIF and outer VIF. For this study's reflective model, the outer VIF used to assess the phenomenon of multicollinearity between the observed items can be disregarded. In the meantime, it is crucial to consider the inner VIF index, which is used to assess the phenomenon of multicollinearity among latent variables. According to Hair et al. (2011), in order to prevent collinearity issues, VIF value should be lower than 5. However, collinearity situations may arise even at lower VIF values ranging from 3 to 5. Ideally, it is recommended that the VIF values be in close proximity to 3 or lower (Hair et al., 2019).

Subsequently, an assessment of the impact relationship among the variables will be conducted, utilizing the outcomes of the Bootstrap analysis executed on the software. Two crucial metrics to take into account are the Original Sample, which refers to normalized effect coefficients, and P Values, which indicate the level of statistically significant of a hypothesis testing. The P value  $< 0.05$  are frequently seen in scientific articles. Furthermore, in order to assess the influence of independent variables on a dependent variable within the SEM framework, the  $R^2$  (or adjusted  $R^2$ ) will be employed. In other words, the  $R^2$  statistic shows the variance in the endogenous variable that can be attributed to the exogenous variable(s). This indicator has a range from 0 to 1. A higher value of  $R^2$  indicates a greater degree of explanatory power of the independent variables with respect to the dependent variable. According to Hair et al. (2019), in academic research,  $R^2$  values of 0.75, 0.50, or 0.25 for endogenous latent variables can be roughly categorized as substantial, moderate, or weak, respectively.

Chin et al. (1996) have emphasized the importance for researchers to not only indicate the significance of the relationship between variables, but also to report the effect size of these variables. The magnitude of the impact of the independent variable on the dependent variable can be determined by the effect size, which is denoted by the coefficient  $f^2$ . Regarding their applicability, there exists a notable similarity between  $f^2$  and the Original Sample in terms of showing the order of impact of the independent variables on the dependent variable. Nonetheless, the Original Sample does not provide an assessment of the magnitude of the effect, whether it is significant or insignificant.  $f^2$  is likely to propose certain thresholds that can aid in the identification of this phenomenon. In particular, Cohen (1988) introduced the  $f^2$  index table as a means of assessing the significance of independent variables as follows:

Table 5: Meaning of  $f^2$  index

$f^2$ value	Meaning
$f^2 < 0.02$	The effect is extremely small or has no effect.
$0.02 \leq f^2 < 0.15$	The impact is small
$0.15 \leq f^2 < 0.35$	The impact is medium
$f^2 \geq 0.35$	The impact is high

In addition, Stone and Geisser (1974) suggested the  $Q^2$  index to assess the model's predictive ability. And the threshold is used to assess the predicted level in accordance with the  $Q^2$  index provided by Hair et al (2019) by the following:

Table 6: Meaning of  $Q^2$  index

$Q^2$ value	Meaning
$0 \leq Q^2 \leq 0.25$	Low predictability
$0.25 \leq Q^2 \leq 0.5$	Average predictability
$Q^2 > 0.5$	High predictability

To sum up, based on previous studies, the key indicators used to analyze the PLS-SEM model of this paper are presented in detail in the table below.

Table 7: The key indicators

Step 1: The examination of measurement model		Factor loading $\geq 0.7$	Hair et al., 2014
	Reliability	Cronbach's Alpha $> 0.7$	George and Marllery, 1999 Hair et al., 2019
		$0.7 \leq CR \leq 0.9$	Hair et al., 2014
	Validity	AVE $\geq 0.5$	Fornell and Larcker, 1981
		HTMT $< 0.85$ (or 0.9)	Roemer et al., 2021 Hair et al., 2019
Step 2: The examination of structural model	Collinearity issues	VIF $< 5$	Hair et al., 2011 Hair et al., 2019
	The significant of a hypothesis testing	P value $< 0.05$	Hair et al., 2019
	Explanation of target endogenous variable variance	$0 < R^2 < 1$	Hair et al, 2019
	Effect size	$f^2$ (Shown in table 5)	Cohen, 1988
	Predictive relevance	$Q^2$ (Shown in table 6)	Hair et al, 2019

## Chapter 4: TECHNICAL DATA ANALYSIS AND FINDINGS

This chapter will provide an overview of the analysis results obtained by the utilization of SmartPLS software. The results will be presented sequentially through sections and tables as follows: Initially, in section 4.1, the application of descriptive statistics will be executed to facilitate the comprehension of the survey sample by the reader. Subsequently, the outcomes of the measurement model analysis are presented in section 4.2 to evaluate the reliability validity of the variables in the research model. Finally, Section 4.3 outlines the findings of the structural model analysis, which includes the assessment of indicators pertaining to the significance of the hypothesis and the degree of influence among the variables.

### 4.1. Descriptive statistics

#### 4.1.1 Respondents' characteristics

Table 8: The distribution of respondents' characteristic

Sample	Category	Vietnam (160 participants)		Norway (140 participants)	
		Number	Percentage (%)	Number	Percentage (%)
Age	20-30 years old	59	36.9	29	20.7
	30-40 years old	71	44.4	65	46.4
	40-50 years old	30	18.8	46	32.9
Gender	Female	87	54.4	69	49.3
	Male	73	45.6	71	50.7
Education level	Highschool	35	21.9	13	9.3
	University/ College	107	66.9	103	73.6
	Postgraduate	18	11.3	24	17.1
Frequency of online social network usage	Rarely (<1hour/day)	18	11.3	26	18.6
	Often (<1-3hours/day)	68	42.5	55	39.3
	Usually (3-5hours/day)	57	35.6	44	31.4
	Always (>5hours/day)	17	10.6	15	10.7
Online shopping frequency	Rarely (0-2 times/week)	53	33.1	44	31.4
	Often (2-5 times/week)	67	41.9	67	47.9
	Usually (5-10 times/week)	26	16.3	23	16.4
	Always (>10 times/week)	14	8.8	6	4.3

For analyzing the demographic of participants, the study uses the main value - frequency in the table below, to count the number and shows the percentages. After that, it evaluates which group takes the highest or the lowest percentages.

- ❖ Age: Table 8 shows the distribution of age group of participants. The participants are divided into three main groups. In Vietnamese side, 59 persons of group 1 are at the age of 20 to 30 years old, it takes 36.9% in total. The second group who are between the age of 30 to 40 years old correspond to 44.4%. The residual group comprises 30 individuals within the age range of 40 to 50, representing 18.8% of the total Vietnamese participants. Likewise, among the 140 Norwegian people who were surveyed, the proportion of individuals belonging to groups 1, 2, and 3 were 20.7%, 46.4%, and 32.9%, correspondingly. Evidently, the second group exhibits the greatest proportion in both nations. The survey conducted in Norway had a higher participation rate among individuals aged 40 to 50 in comparison to that of Vietnam. This assertion is justifiable upon examining the demographic profiles of the two nations in question. The demographic profile of Vietnam indicates a comparatively lower average age of the populace in contrast to Norway.
- ❖ Gender: In the context of Vietnam, 54.4% represents the female participants, while the remaining percentage (45.6%) corresponds to the male participants. The survey results indicate that 49.3 % of the respondents in Norway were female, while 50.7 % were male. The presented data indicates that there exists a relatively small discrepancy between male and female participation rates in the survey across both nations.
- ❖ Educational level: The results of the survey indicate that individuals who possess university degrees constituted the largest percentage of respondents in Vietnam and Norway, with figures of 66.9% and 73.6% respectively. In Norway, the proportion of individuals possessing postgraduate qualifications is 17.1%, which is greater than that of Vietnam, where the corresponding figure is 11.3%. By contrast, the proportion of individuals with high school level in Vietnam's target group is 21.9%, which exceeds that of Norway's (9.3%).
- ❖ Frequency of online social network usage: The utilization frequency of social networks has been categorized into four distinct levels as outlined in table 8. The demographic that spends 1 to 3 hours per day on social networking applications constituted the highest percentage in both nations, with figures of 42.5 and 39.3 correspondingly. Subsequently, it was found that 35.6% of Vietnamese participants and 31.4% Norwegian participants usually spend 3 to 5 hours for using social networking platforms. Merely 10.6% of individuals in Vietnam and 10.7% in Norway exhibit the highest degree of social network utilization. The remaining participants belongs to the category of infrequent users, accounting for 11.3% (Vietnam) and 18.6% (Norway).
- ❖ Online shopping frequency: In addition to assessing the frequency of social media usage, the research study also gathered data on the online shopping behaviors of participants, which were evaluated across four distinct levels. In Vietnam, the proportions of individuals who engage in

online shopping varies according to frequency (rare, often, usually, and always) are 33.1%, 41.9%, 16.3%, and 8.8% respectively. The findings in Norway exhibit resemblance, as evidenced by the distribution of four levels of shopping ranging from low to high, which are 31.4%, 47.9%, 16.4%, and 4.3%, respectively.

To sum up, the data presented above indicates that the study sample acquired through the survey in both countries exhibits numerous similarities, with comparable participant group sizes and characteristics. Consequently, the comparative analysis between countries in this research holds significance and validity.

#### 4.1.2. Mean -Analysis

Table 9: Descriptive statistics

	Vietnam (N=160)		Norway (N=140)	
	Mean	Std. Deviation	Mean	Std. Deviation
KNO1	3.13	.939	3.95	.984
KNO2	3.22	.909	3.28	.805
KNO3	2.42	1.000	3.11	.898
KNO4	2.32	.980	3.21	.869
AFF1	3.22	.866	4.27	.912
AFF2	4.01	.801	4.34	.862
AFF3	4.01	.781	3.49	.782
AFF4	3.58	.756	2.54	.925
TRU1	3.27	.791	3.39	.775
TRU2	3.34	.862	3.35	.739
TRU3	3.19	.894	3.46	.781
RIS1	2.29	.620	3.25	.769
RIS2	3.24	.668	4.11	.679
RIS3	2.31	.700	3.22	.759
BEH1	3.29	.678	3.21	.785
BEH2	4.01	.816	4.00	.805
BEH3	4.01	.781	4.01	.869
BEH4	3.38	.662	3.34	.836

When analyzing descriptive statistics of each item, mean value is often focused and considered to measure the average level of respondents' agreement. In Likert 5, the medium of mean value is 3, so if the answer is from 3 to 5, the respondent agrees with the point of the given variable and conversely. Table 9 shows that most of the items' mean values are from 3 to 4,

representing the consent of the participants' opinion to the view of author. In Vietnam, AFF2, AFF3, BEH2 and BEH3 are the observed items with the largest mean value, showing the high agreement between the opinion of the survey participants and the author's opinion. Meanwhile, the observed items with the largest mean value in Norway are AFF1, AFF2, RIS2, BEH2 and BEH3. The mean values of the observed items KNO3, KNO4, RIS1, and RIS3 in Vietnam are 2.42, 2.32, 2.29, and 2.31, respectively. These results indicate that most of the survey participants hold a viewpoint that is contrary to that of the author. In Norway, the disagreement between many participants and author was found only in the item AFF4, with a mean value of 2.54.

## 4.2. The examination of measurement model

The initial stage of assessment PLS-SEM outcomes entails examining the measurement models. The relevant requirements exhibit variation between reflective and formal constructs (Hair et al., 2019). This study incorporates some indicators, including factor loading, reliability, and validity as the measures of reflective constructs.

### 4.2.1. Factor loadings

Factor Loadings (Vietnam)						Factor Loadings (Norway)					
	AFF	BEH	KNO	RIS	TRU		AFF	BEH	KNO	RIS	TRU
AFF1	0.735					AFF1	0.772				
AFF2	0.780					AFF2	0.825				
AFF3	0.777					AFF3	0.790				
AFF4	0.835					AFF4	0.757				
BEH1		0.859				BEH1		0.880			
BEH2		0.746				BEH2		0.791			
BEH3		0.799				BEH3		0.775			
BEH4		0.842				BEH4		0.825			
KNO1			0.780			KNO1			0.818		
KNO2			0.788			KNO2			0.833		
KNO3			0.832			KNO3			0.793		
KNO4			0.783			KNO4			0.827		
RIS1				0.849		RIS1				0.893	
RIS2				0.820		RIS2				0.833	
RIS3				0.888		RIS3				0.906	
TRU1					0.808	TRU1					0.831
TRU2					0.847	TRU2					0.808
TRU3					0.865	TRU3					0.859

Table 10: Factor Loadings



From table 10, the first component is defined by four items (AFF1, AFF2, AFF3, and AFF4). The second component is defined by four items (BEH1, BEH2, BEH3 and BEH4). The third component is defined by four items (KNO1, KNO2, KNO3 and KNO4). Next, the fourth component is defined by three items (RIS1, RIS2 and RIS3). The fifth component is defined by three items (TRU1, TRU2 and TRU3). In conclusion, the proposed theoretical model contains 18 measuring items which are grouped into 5 components and the following: Affect (AFF), Precautionary behavior (BEH), Knowledge (KNO), Risk perception (RIS), and Trust (TRU). As mentioned in section 3.4.2 above, if all the observed items possess a factor loading value exceeding 7, then it is imperative to ensure that the latent variable can account for a minimum of 50% of the observed item's variation. Consequently, it is unnecessary to eliminate any variables that are observable. Thus, it can be concluded that the aforementioned variables have been conserved and there is no necessity to eliminate any items.

#### 4.2.2. The reliability of constructs

There are two common indicators used to measure reliability are Cronbach's Alpha and Composite Reliability (CR).

Table 11: Construct Reliability

Construct reliability (Vietnam)				Construct reliability (Norway)			
	Cronbach's Alpha (CA)	rho_A	Composite Reliability (CR)		Cronbach's Alpha (CA)	rho_A	Composite Reliability (CR)
AFF	0.788	0.792	0.863	AFF	0.794	0.796	0.866
BEH	0.829	0.845	0.886	BEH	0.836	0.844	0.890
KNO	0.808	0.818	0.873	KNO	0.835	0.835	0.890
RIS	0.812	0.814	0.889	RIS	0.852	0.864	0.910
TRU	0.794	0.812	0.878	TRU	0.780	0.787	0.872

Based on the data obtained in Vietnam, the CA index of variable AFF, BEH, KNO, RIS, TRU is 0.788, 0.829, 0.808, 0.812, 0.794 respectively. These indices exhibit values exceeding 0.7, thereby establishing the reliability of each variable. Moreover, the reliability of these variables is further guaranteed by the fact that their CR values range from 0.7 to 0.9 (shown in table 11).

Likewise, Norwegian data indicates that most of the variables are deemed reliable, as evidenced by the CA index exceeding 0.7 for each variable and the CR index falling within the range of 0.7 to 0.9. However, it is noteworthy that solely the CR index of the RIS variable attains a value of 0.91. Because of not being significantly divergent from the Hair's standard (from 0.7 to 0.9 and less than 0.95), this value remains within acceptable limits.

In conclusion, the constructs' reliability is secured through analyzing survey data from both nations.

### 4.2.3. The validity of constructs

Table 12: The convergent validity of constructs

Average Variance Extracted AVE (Vietnam)	
AFF	0.613
BEH	0.660
KNO	0.633
RIS	0.727
TRU	0.707

Average Variance Extracted AVE (Norway)	
AFF	0.618
BEH	0.670
KNO	0.669
RIS	0.771
TRU	0.694

As previously stated, the convergent validity of a scale can be established by verifying that its AVE exceeds 0.5, according to Fornell and Larcker's (1981). Hence, table 12 demonstrates that the scales pertaining to each construct exhibit convergence.

Table 13: The discriminant validity of constructs

Heterotrait-Monotrait Ratio HTMT (Vietnam)					
	AFF	BEH	KNO	RIS	TRU
AFF					
BEH	0.591				
KNO	0.415	0.424			
RIS	0.691	0.864	0.661		
TRU	0.087	0.406	0.181	0.607	

Heterotrait-Monotrait Ratio HTMT (Norway)					
	AFF	BEH	KNO	RIS	TRU
AFF					
BEH	0.534				
KNO	0.369	0.622			
RIS	0.674	0.857	0.849		
TRU	0.176	0.196	0.266	0.276	

The current study evaluates the discriminant validity of constructs using the HTMT index. Table 13 shows that the indexes are all below 0.9 in both countries, indicating that the variables in the research model exhibit acceptable divergence.

### 4.3. The examination of structural model

Upon achieving a satisfactory measurement model evaluation, the subsequent stage in evaluating the results of PLS-SEM involves the assessment of the structural model. The assessment standards that require scrutiny involve various indicators such as the measure of multicollinearity VIF, effect size  $f^2$ , predictive relevance  $Q^2$ , the significant of a hypothesis testing P value, and explanation of target endogenous variable variance  $R^2$ .

### 4.3.1. The measurement of collinearity

According to Hair et al. (2019), the coefficients of the structural model pertaining to the relationships among the constructs are obtained by estimating a set of regression equations. Therefore, prior to evaluating the research model, it is imperative to conduct an examination of collinearity to ensure that it does not introduce any bias into the regression outcomes. The index used to measure collinearity in this study, denoted as inner VIF, is displayed in table 14 below. Evidently, all indices exhibit values less than 5, thereby fulfilling the requirements for the absence of multicollinearity among the structures.

Table 14: The measurement of collinearity

Inner VIF values (Vietnam)						Inner VIF values (Norway)					
	AFF	BEH	KNO	RIS	TRU		AFF	BEH	KNO	RIS	TRU
AFF				1.129		AFF				1.109	
BEH						BEH					
KNO				1.152		KNO				1.131	
RIS		1.000				RIS		1.000			
TRU				1.021		TRU				1.047	

### 4.3.2. The significance of hypotheses testing.

Impact relationships among the research model are evaluated based on the results of a Bootstrap 5000 samples conducted using SmartPLS software.

❖ In Vietnam:

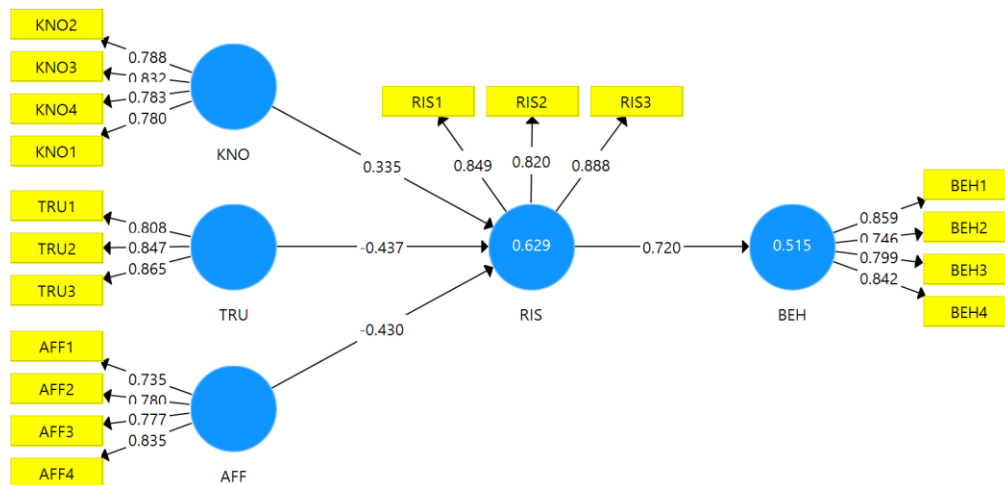


Figure 4: SEM diagram (Vietnam)

Table 15: The significant of hypotheses testing in Vietnam

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV)	P Values
AFF -> RIS	-0.430	-0.435	0.053	8.134	0.000
KNO -> RIS	0.335	0.332	0.049	6.906	0.000
RIS -> BEH	0.720	0.726	0.061	11.753	0.000
TRU -> RIS	-0.437	-0.435	0.059	7.396	0.000

As previously stated, the evaluation of the proposed hypothesis' significance is conducted based on the P value. When the P values are less than 0.05, it indicates that the hypotheses regarding the significant impact relationship between the variables are supported. Therefore, according to table 15, in the context of Vietnam, all the proposed hypotheses are significant. It means that the perception of risk (RIS) regarding using Fintech is shaped by three key factors, namely affect (AFF), knowledge (KNO), and trust (TRU). And precautionary behaviors of Fintech users (BEH) are driven by risk perception (RIS) (Figure 4).

Moreover, the dissimilarity in the level of influence among the variables is evidenced by the O value (Original sample). The absolute value of the coefficient is directly proportional to the degree of influence. According to Table 14, the variable TRU has the greatest impact on RIS, followed by AFF and KNO. Nevertheless, the level of the three variables' impact on RIS exhibits a relatively small disparity.

❖ In Norway:

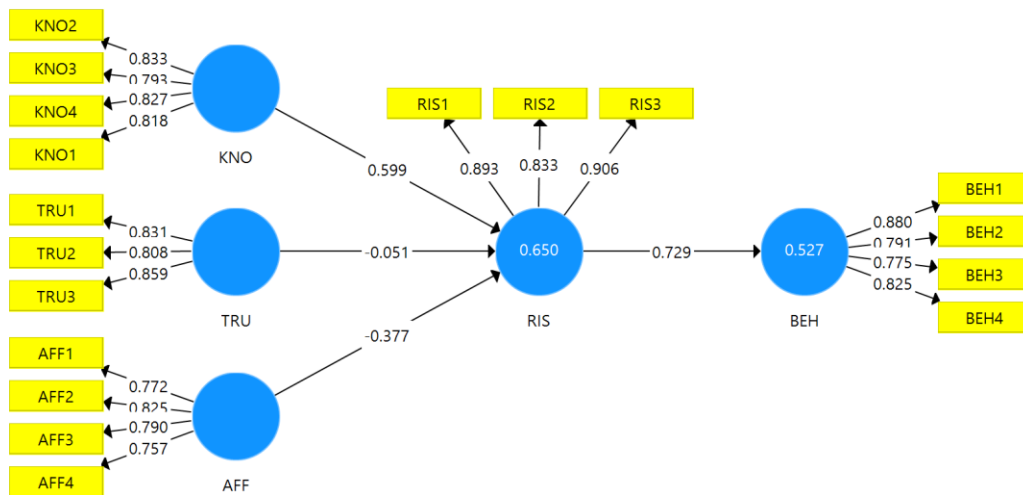


Figure 5: SEM diagram (Norway)

Table 16: The significant of hypotheses testing in Norway

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
AFF -> RIS	-0.377	-0.376	0.059	6.388	0.000
KNO -> RIS	0.599	0.598	0.055	10.819	0.000
RIS -> BEH	0.729	0.733	0.063	11.502	0.000
TRU -> RIS	-0.051	-0.059	0.042	1.210	0.226

The results from the Norwegian study demonstrate the statistical significance of the hypothesis regarding the impact of affect (AFF) and knowledge (KNO) on risk perception (RIS), as evidenced by a p-value below the threshold of 0.05. Nevertheless, the hypothesis regarding the impact of trust (TRU) on risk perception (RIS) lacks statistical significance as the p-value exceeds the established threshold of 0.05 (P=0.226). In other words, the risk perception of Fintech users in Norway is solely impacted by affect and knowledge. Moreover, the significance of the hypothesis that precautionary behavior is influenced by risk perception is supported, as indicated by the p-value being less than 0.05.

The O values (Original sample) indicate that the hierarchy of influence on the perception of risk (RIS) is led by knowledge (KNO), followed by affect (AFF).

#### 4.3.3. The explanation of target endogenous variable variance $R^2$

R Square (or adjusted  $R^2$ ) statistics shows the variance in the endogenous variable explained by the exogenous variable(s).

In Vietnam, the adjusted  $R^2$  for the dependent variable RIS is 0.629%. Thus, the independent variables (AFF, KNO, TRU) influencing RIS account for 62.9% of this variable's variance. BEH has an adjusted  $R^2$  of 0.515. Therefore, the independent variable RIS accounts for 51.5% of the variance in the dependent variable BEH.

In Norway, the independent variables (AFF, KNO) placing influence on the dependent variable RIS account for 65% of its variation. And the adjusted  $R^2$  of BEH variable is 0.527, suggesting that the explanatory variable RIS accounts for 52.7% of the variability observed in BEH.

Table 17: The explanation of target endogenous variable variance  $R^2$

Vietnam		
	R Square	R Square Adjusted
BEH	0.518	0.515
RIS	0.636	0.629

Norway		
	R Square	R Square Adjusted
BEH	0.531	0.527
RIS	0.657	0.650

#### 4.3.4. The effect size $f^2$

Compared to the O value (original sample), which indicates the level and order of the independent variables' impact on the dependent variable, the  $f^2$  index is also employed to assess the impact of each independent variable on the dependent variable. However, the index will be subject to comparison with specified thresholds, such as those outlined in Table 5, in order to clarify the significance of the effect of the independent variable on the dependent variable.

Firstly, based on the data table from Vietnam, it can be inferred that the variable KNO has a medium impact on RIS, as per Cohen (1988)'s rule, due to the fact that the effect size ( $f^2$ ) is greater than 0.15. The variables AFF and TRU exhibit a strong impact on RIS, as their  $f^2$  exceed 0.35. In addition, BEH variable also strongly influenced by RIS variable, due to the high value of  $f^2$ .

Secondly, in Norway, the variables AFF and KNO are posited to have considerable impact on the variable RIS, as indicated by the respective  $f^2$  values of 0.374 and 0.925, both of which exceed the threshold of 0.35. The estimated f value for the interaction of the variables TRU and RIS is 0.007, indicating a lack of impact between the two variables as it falls below the threshold of 0.02. The variable RIS is deemed to have a significant impact on BEH due to the fact that the value  $f^2$  exceeds 0.35.

Table 18: The effect size  $f^2$

Vietnam						Norway					
	AFF	BEH	KNO	RIS	TRU		AFF	BEH	KNO	RIS	TRU
AFF				0.449		AFF				0.374	
BEH						BEH					
KNO				0.268		KNO				0.925	
RIS		1.074				RIS		1.132			
TRU				0.513		TRU				0.007	

#### 4.3.5. The predictive relevance $Q^2$

Table 19: Out-of sample predictive power  $Q^2$

Vietnam				Norway			
	SSO	SSE	$Q^2$ (=1-SSE/SSO)		SSO	SSE	$Q^2$ (=1-SSE/SSO)
AFF	640.000	640.000		AFF	560.000	560.000	
BEH	640.000	426.029	0.334	BEH	560.000	364.784	0.349
KNO	640.000	640.000		KNO	560.000	560.000	
RIS	480.000	262.175	0.454	RIS	420.000	212.972	0.493
TRU	480.000	480.000		TRU	420.000	420.000	

$Q^2$  is a statistical metric that evaluates the predictive relevance of a given model. It is used to determine whether a model possesses the ability to accurately predict outcomes or not.  $Q^2$  values greater than zero signify that the reconstructed values are accurate, and the model possesses predictive significance.

According to the criteria established by Hair et al. (2019) for evaluating the predictive power of the Q Square index, the component model for the dependent variables BEH and RIS in Vietnam exhibit  $Q^2$  values of 0.334 and 0.454 respectively, falling within the range of 0.25-0.5. Therefore, this model can be considered to have moderate predictive accuracy.

In Norway, the component model for BEH and RIS also exhibited moderate accuracy in their predictive, because their  $Q^2$  values are 0.349 and 0.493 respectively.

## Chapter 5: DISCUSSIONS AND CONCLUSIONS

This part will provide a presentation of the primary findings of the study. The outcomes of the hypotheses H1, H2, H3, and H4, as stated in section 2, are presented in sections 5.1, 5.2, 5.3, and 5.4, respectively. The present analysis is based on the data and outcomes outlined in Section 4. Additionally, it is intended to clarify the disparities in the findings between Vietnam and Norway.

Based on the technical analysis from section 4, the research results of the hypotheses are summarized in the following table:

Table 20: The results of hypothesis testing

Hypothesis testing	Vietnam	Norway
H1: <i>Knowledge</i> has a significant impact on how users perceive information risk when using Fintech.	Positive and medium impact	Positive and strong impact
H2: <i>Affect</i> has a significant impact on how users perceive information risk when using Fintech.	Negative and strong impact	Negative and strong impact
H3: <i>Trust</i> has a significant impact on how users perceive information risk when using Fintech.	Negative and strong impact	Insignificant
H4: <i>Users' perception</i> about information security risk when using Fintech can be considered as predictors of <i>their precautionary behavior</i> .	Positive and strong impact	Positive and strong impact

### 5.1. Knowledge has an impact on risk perception of users regarding cyber security when using Fintech in both countries.

The perception of risk is significantly influenced by knowledge, according to some scholarly discourses (Aksit et al., 2018; Aven et al., 2021). Drawing upon the aforementioned perspective that has been adopted in numerous studies across different fields, the present study proposes that knowledge has an impact on the risk perception of cybersecurity among Fintech users. The term "knowledge" can be defined as understanding or information about a topic that an individual or organization has gained via personal experience or academic investigation. Thus, this factor is assessed and analyzed by means of four items (KNO1, KNO2, KNO3, KNO4) present in the survey. The technical analysis indicates that these variables exhibit both reliability and validity (shown in section 4.2). Furthermore, by means of descriptive statistics, the analysis of the gathered responses also demonstrates the consistency among the items and their quality.



Based on survey data collected in Vietnam, it can be observed that items KNO1 and KNO2 exhibit mean values greater than 3, indicating a general agreement among the respondents with the opinion presented by the author. To clarify, a significant majority of the participants exhibit a high level of ability in utilizing Fintech applications as part of their routine activities. In addition, they frequently access data pertaining to the financial technology platform. This argument is reasonable as Vietnam is widely regarded as a highly competitive market in this particular industry, characterized by a rapid rate of expansion (Nathan et al., 2022). Internet banking services and e-wallets are widely recognized and utilized by the general population. Furthermore, the rapid growth of E-commerce in Vietnam has led to a surge in the need for online shopping and payment services, thereby facilitating the widespread adoption of Fintech applications in daily life. The dissemination of information regarding Fintech applications has become common through various communication channels, particularly social media platforms. The accessibility of information regarding these applications is frequent and effortless for all individuals. Nevertheless, the average values of KNO3 and KNO4 fall below 3, suggesting a prevailing disagreement among the respondents towards the author's viewpoint. The data gathered from the survey indicates that the respondents hold the belief that they have an incomplete comprehension of the probable hazards linked to the utilization of Fintech, particularly in relation to cybersecurity risks. This is evidenced by the mean value of KNO3, which is less than 3, indicating a lack of agreement with the author's perspective by most participants. This assertion is reasonable given that the complexities and intricacies associated with cybersecurity and its associated hazards remain ambiguous and difficult to articulate (Kimmerle, 2015). Instances of frauds and cybersecurity threats are prevalent in Vietnam, primarily attributed to inadequate comprehension and awareness concerning Fintech applications and network security.

By way of contrast, in Norway, the average score for items KNO1, KNO2, KNO3, and KNO4 surpasses 3, which suggests that many participants agree with the perspective presented by the author. A significant proportion of the Norwegian population has experience in utilizing Fintech applications. Information pertaining to this field and topic is extensively spread and easily accessible through various communication channels. According to the those surveyed, they possessed a moderate level of comprehension regarding the cybersecurity risks associated with the utilization of internet banking applications or e-wallets. Furthermore, it is noteworthy that individuals perceive themselves as possessing adequate knowledge and comprehension to effectively utilize and oversee Fintech applications. This assertion is reasonable as Norway is at the forefront of Fintech advancements, with a decrease in the utilization of physical currency within its borders.

Once the variables have undergone quality assurance, the correlation between knowledge and risk perception is analyzed. The findings obtained from the software analysis indicate that knowledge plays a significant role in shaping risk perception in both nations. In particular, the results suggest that individuals who possess a greater degree of knowledge and expertise in the field of fintech tend to exhibit a heightened level of risk perception. Nevertheless, the magnitude of influence between the two variables exhibits dissimilarities when contrasting the two nations. The impact of knowledge on risk perception in Vietnam is moderate, with an effect size of

0.265, surpassing the threshold of 0.15. Furthermore, among the three factors that are deemed to exert an influence on risk perception, it is noteworthy that the impact of knowledge on perception is lowest (with an absolute O value of 0.335) among three independent variables. In the context of Norway, the perception of risk is primarily influenced by knowledge (with an absolute O value of 0.599). Moreover, the impact of knowledge on risk perception is deemed to be significant, as indicated by a strong effect size of 0.95, surpassing the established threshold. 0.35).

## **5.2. Affect and their impacts on risk perception regarding cyber security of Fintech users.**

Numerous studies have demonstrated the impact of affect on risk perception (Slovic & Peters, 2006b). Positive affect and negative affect are known to exert distinct influences on risk perception (Haase & Silbereisen, 2011; Sobkow et al., 2016). The present investigation examines the correlation between these two variables, in which affect is defined through four items, namely AFF1, AFF2, AFF3, and AFF4, which pertain to positive emotions and good experiences when using the Fintech applications. In Vietnam, most survey participants exhibit agreement with the views expressed in each variable, as evidenced by the descriptive statistics and mean value analysis conducted on the observed variables (all mean values exceed 3). A large number of Vietnamese participants exhibit an exciting towards technological applications as a means of conducting financial transactions such as payment, money transfer, and investment, rather than traditional financial methods. These applications are preferred due to their convenience, which is attributed to their ability to facilitate fast transactions and offer low costs. Furthermore, individuals tend to experience a greater sense of motivation and security when they observe friends and family members utilizing fintech applications. Consequently, a limited proportion of participants experience feelings of anxiety or insecurity while engaging with the Fintech apps. The findings derived from data analysis conducted in Norway exhibited a resemblance to those of Vietnam, but with a higher proportion of respondents reporting feelings of anxiety and uncertainty regarding potential hazards associated with Fintech usage. The majority of respondents hold a disagreeing position towards the perspective presented by the author in item AFF4, as indicated by the mean value of 2.54, which falls below the threshold of 3. The process of assessing the mean value facilitates a more comprehensive understanding of the coherence among variables. Furthermore, the reliability and validity of observed variables are ensured by the indexes obtained through the smartPLS processing software, as previously mentioned.

The p-value analysis in both nations indicates that the proposed hypothesis (H2) has been confirmed, as the impact between affect variable and risk perception variable meets the necessary criteria. Affect exhibits an inverse relationship with risk perception. This implies that individuals who express positive emotions and experiences towards Fintech are more likely to perceive lower risks associated with cyber security issues when utilizing such technology. The absolute O value of AFF for RIS in Vietnam and Norway is 0.43 and 0.377, respectively. This places AFF as the second most impactful independent variable among the three. The study

found that the effect size of AFF for RIS was 0.449 in Vietnam and 0.374 in Norway, both exceeding the threshold of 0.35. Therefore, it can be concluded that the impact of AFF on RIS is statistically significant or strong.

### **5.3. The relationship between trust and risk perception in terms of cyber security risk when using Fintech applications.**

This study suggests a hypothesis regarding the impact of trust on the awareness of potential hazards associated with the utilization of innovative financial technology applications, drawing upon the findings of numerous prior studies. The trust variable is assessed using three items, namely TRU1, TRU2, and TRU3. These items respectively assess the user's evaluation of the safety of Fintech applications, the individual's ease of trust, and the individual's belief in the responsibility and managing ability of relevant organizations (such as the founding company and authority) in the occurrence of risks. The findings derived from the analysis of the data exhibit compliance with the claims and research outcomes of other scholars. In particular, the impact of trust on the perception of risk varies between the two nations when assessed.

The results of descriptive statistical analysis conducted in Vietnam indicate that a large proportion of survey participants agree with the author's perspective on each observed item. The mean values of TRU1, TRU2, and TRU3 are 3.27, 3.34, and 3.19, respectively, which all exceed the mean of 3. A majority of respondents state that they have confidence in the security of the products and applications they utilize, such as internet banking and e-wallets. It is also believed that in the event of incidents pertaining to theft or fraud of information-property, the burden of responsibility for addressing and redressing damages falls upon the relevant authorities and organizations associated with the application. This assertion is justifiable as in Vietnam, the prevalent Fintech applications that are commonly utilized by individuals are predominantly furnished by prominent financial institutions and technology enterprises with the support of government and foreign investments (Nguyen, 2020; Phung, 2023), thereby instilling a sense of trust and assurance among customers regarding the security of their financial transactions. Moreover, socio-political and cultural systems demonstrate a significant level of personal reliance on authoritative institutions. In particular, a cultural orientation characterized by high levels of authoritarianism has the potential to foster trust in public institutions among citizens (Jamil & Baniamin, 2021). Therefore, as a socialist nation with a single political party, Vietnamese people exhibit a relatively high level of trust in public organizations. Additionally, the study's participants indicated a tendency towards easily placing trust in unfamiliar people during initial meetings. The responses exhibit a high level of coherence and logical harmony, ensuring the reliability and validity of each observed item and latent variable. The statistical analysis suggests that there exists a significant relationship between trust and risk in the context of Fintech usage, as evidenced by a p value of less than 0.05. Specifically, the results indicate that trust plays a role in shaping the risk perception of Fintech users. The absolute value of original samples O is 0.437, indicating that belief holds the highest rank among the three independent variables in terms of its influence on risk

perception. Furthermore, the effect size value of 0.513, which exceeds the threshold of 0.35, provides evidence of the strong influence of trust on the risk perception of Vietnamese individuals in their utilization of financial technology applications. The findings of this investigation confirm the idea that trust has a significant role in shaping individuals' risk perception when confronted with limited knowledge (Aven, 2021). As previously indicated, the study's participants reported a lack of sufficient understanding regarding fintech and cyber security risks, as evidenced by mean values of KNO3 and KNO4 that were below 3. Additionally, the influence of knowledge on risk was found to be of medium magnitude, with an effect size  $f^2$  of 0.256, which was the lowest among the three variables examined. Hence, it can be inferred that trust holds greater significance than knowledge in predicting the risk perception of Fintech users in Vietnam.

Nevertheless, the survey conducted in Norway yields disparate outcomes compared to that of Vietnam. The survey results indicate that most Norwegian respondents concur with the perspective presented, which assesses user trust based on the observed variables TRU1, TRU2, and TRU3, with corresponding mean values of 3.39, 3.35, and 3.46. The obtained responses in Norway are deemed reasonable, considering the socio-political and cultural context. Although users place their trust in the security of Fintech applications and the associated companies and organizations, their perception of potential risks remains largely unaffected by this trust. The results of the SmartPLS analysis indicate that the p value for the hypothesis regarding the impact of trust on risk perception is 0.226, which exceeds the established threshold of 0.05. Therefore, it can be concluded that the hypothesis lacks statistical significance. The primary determinant of risk perception among Norwegians when utilizing Fintech applications is knowledge, thereby diminishing the predictive capacity of trust in this regard.

#### **5.4. Risk perception plays an important role in forecasting precautionary behavior of Fintech users.**

This study proceeds to examine the potential impact of risk perception on precautionary behavior after a review and analysis of three factors that affect risk perception. The findings of this study align with the perspectives offered by some scholars (Van Der Pligt, 1998; Van Schaik et al., 2018; Iorfa et al., 2020), as they indicate that risk perceptions pertaining to cyber security have the potential to forecast the hedging tendency of Fintech consumers. The greater the level of risk awareness among users, the more likely they are to engage in precautionary measures aimed at reducing and mitigating risks to the lowest possible extent. The article's assessment of the risk factor is conducted via three distinct elements, namely RIS1, RIS2, and RIS3. The perspectives articulated in every observed parameter are based on the conceptualization of risk explained by Aven (2021). Hence, in evaluating risk perception, it is imperative to take into account factors such as prediction of probability, the severity of consequences, and risk-benefit comparison, respective to the three elements mentioned above. In addition, the factor of precautionary behavior is defined by four items (BEH1, BEH2, BEH3, BEH4), which indicate a tendency towards enhancing knowledge and exercising cautiousness while utilizing applications.

The analysis conducted on risk perception in Vietnam demonstrates and reveals three primary factors exert an influence on it. These factors, ranked in order of their impact from least to most significant, are knowledge, affect, and trust. A large number of respondents in the survey indicated a lack of adequate understanding regarding the potential hazards associated with Fintech usage. However, they expressed a strong preference towards utilizing Fintech applications due to the perceived advantages they offer over traditional financial methods. Furthermore, there exists a notable degree of belief among individuals regarding the security of applications and the power of organizations to protect their interests in the event of hazardous occurrences. Therefore, it is their opinion that the likelihood of the risk occurring is relatively low, as indicated by a mean value of RIS1 that is less than 3. Furthermore, the advantages offered by these applications are considerably higher than the potential hazards (with a mean of RIS3 less than 3). But they concur with the perspective that the occurrence of cyber security risks while utilizing Fintech can lead to severe consequences such as information theft, counterfeiting, and property loss. This is indicated by a mean value of RIS2 that exceeds 3. It can be seen that there exists a moderate/ significant level of awareness among them regarding the potential hazards linked with the utilization of Fintech. Consequently, individuals tend to engage in precautionary measures to mitigate risks and safeguard their interests, as evidenced by the mean values expressed in items BEH1, BEH2, BEH3, and BEH4, all of which exceed a score of 3. The findings of the model analysis indicate that the hypothesis concerning the correlation between risk perception and precautionary behaviors meets the necessary criteria, as the p value is below 0.05. This provides evidence that the hypothesis is statistically significant.

The perception of risk in Norway is significantly impacted by both knowledge and affect, whereas trust has not demonstrated a significant influence on the perceived risk factor. According to the survey respondents, they possess adequate awareness regarding the cybersecurity threats associated with Fintech applications. Despite their preference towards utilizing Fintech, the individual in question still has apprehensions regarding its safety, as indicated by their score of AFF4, which falls below the threshold of 3. Consequently, it can be observed that the level of cybersecurity risk perception in Norway is comparatively high. This is evidenced by the mean values of the item variables RIS1, RIS2, and RIS3, which are 3.25, 4.11, and 3.22, respectively, which are all higher than 3. In addition, the findings from the data collected in Norway indicate that risk perception can be utilized as a predictor of preventive behavior among Fintech users, as the statistical significance level (p value) is below 0.05. The mean values of items BEH1, BEH2, BEH3, and BEH4 exceed a threshold of 3, indicating a high level of agreement among survey respondents with the author's perspective. Specifically, respondents expressed a willingness to acquire additional knowledge, enhance vigilance, avoid disclosing sensitive information, and verify security through other user comments prior to engaging with Fintech applications. In summary, the Fintech user population in Norway exhibits a heightened level of awareness regarding cybersecurity hazards, thereby fostering the adoption of their precautionary measures.

## Chapter 6: THE RESEARCH CONTRIBUTIONS, LIMITATIONS AND SUGGESTIONS

Section 6.1 will present the contributions of research in the academic field and the utilization of findings from studies in practical activities. Furthermore, next section 6.2 will define the limitations of the study and propose some ideas for future research.

### 6.1. Research contributions

#### *Theoretical contribution*

This study provides a noteworthy contribution to the existing research literature pertaining to the domain of risk, specifically in the areas of risk perception and preventive behaviors.

Firstly, this study aims to investigate and evaluate the effects of knowledge, affect, and trust on the formation of individual risk perception, through the creation and evaluation of hypotheses. Despite the fact that numerous scholars across various disciplines have examined the subject mentioned above, significant debate persists. Khan et al. (2021) posited that there exists an inverse relationship between knowledge and perception of risk. Conversely, Aksit et al. (2018) contend that knowledge and risk have a positive correlation. Consequently, the findings of this study may serve as a foundation for strengthening arguments that suggest knowledge and affect as two influential factors which shape the risk perception of fintech users, whereas the impact of trust is contingent upon contextual and other variables. The acquisition of knowledge is positively correlated with risk perception, whereas affect has a negative correlation with risk perception. Furthermore, there is a lack of research in the fintech domain that has explored this matter. Therefore, the findings of this study can be regarded as a suggested premise for future studies in the identical field to investigate deeper.

Secondly, the significance of the research findings is enhanced when analyzed based on the comparison of actual data analysis results from two groups of Fintech customers in two countries: Vietnam and Norway. The model's reasonableness and accuracy, along with the research hypothesis, are supported by the relatively consistent results. Furthermore, the notable contrast in the impact of trust on risk perception between the two nations serves to clarify the assertion posited by Aven (2021). In cases where knowledge is lacking, trust and affect are recognized as significant variables that influence the perception of risk. Most survey participants in Vietnam have reported a deficiency in their understanding of the potential risks associated with utilizing Fintech applications. Consequently, their perception of risk is contingent upon affect and reliance on trust. In Norway, most participants believe that they possess sufficient understanding of Fintech, resulting in minimal impact on their risk perception due to the trust factor.

Lastly, this study demonstrates the impact of risk perception on preventive behavior. The findings provide confirmation for certain research ideas posited by prior scholars, while concurrently introducing a new viewpoint within the field of Financial Technology that is highly significant. Studies on Fintech and associated risks have gained significant popularity,

however, there is a limited number of analytical research has been conducted on the influence of risk perception on users' precautionary actions compared to the research about the influence of risk perception on their Fintech adopting behavior.

### ***Practical contributions***

As previously stated, the Fintech phenomenon has had and will continue to have a significant impact on our daily lives. Consequently, the utilization of this technology poses various hazards, particularly with regards to cyber security, thereby presenting an enormous challenge for users, producers, and legal entities. This study aims to identify the primary factors that can influence risk perception. The findings can inform the development of effective strategies to enhance risk perception among individuals. In Vietnam, enhancing the risk perception of Fintech users necessitates the development of a strategy by founders and associated entities to enhance user knowledge. In Norway, manufacturers can enhance the attraction of new financial technology applications by prioritizing the development of unique characteristics that optimize user experience. This approach may serve to mitigate user apprehensions regarding potential risks and ultimately promote adoption of said applications. Furthermore, the present study establishes that the hedging behavior of Fintech users is impacted by their perception of risk. As a result, organizations and manufacturers can encourage precautionary behavior among Fintech users by enhancing their awareness of cyber security risks. In summary, the findings of the study propose the implementation of effective methods and strategies to enhance risk perception, encourage precautionary behavior, and mitigate hazards associated with the utilization of Fintech.

### **6.2. Research limitations and suggestions for future research**

The primary constraint of this investigation pertains to the size of the sample. The data analysis was conducted on a sample of 160 surveys collected from Vietnam and 140 surveys collected from Norway. The limited sample size utilized in this study may result in a potential lack of complete representativeness of the populations in the two countries. Consequently, the future research could support the findings by augmenting the sample scale or concentrating on specific cohorts of Fintech consumers, such as Generation Y or Generation Z. In addition, subsequent scholars within the identical discipline may further advance this research framework by conducting a more comprehensive analysis of the impact of the three principal variables (i.e., knowledge, affect, trust) on the perception of risk through their sub-elements, such as: experiences and emotions are sub-elements of affect factor; cause-knowledge and impact-knowledge are sub-elements of knowledge factor. Besides, when conducting cross-country comparisons, it is advisable to take into account the influence of culture on the variables under examination, as well as the interplay between them. Culture may be regarded as a moderating factor in this regard.

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## APPENDIX 1: QUESTIONNAIRE

### Factors affecting user's risk perception and precautionary behavior when using Financial technology

#### Part 1: Basic information

*Please tick ✓ the appropriate box!*

First Name: (Optional question)

Country:

Age:

- 20-30 years old
- 30-40 years old
- 40-50 years old

Gender:

- Female
- Male

Educational level:

- High school
- University
- Postgraduate (MSc/PhD...)

Frequency of online social network usage:

- Rarely (<1hour/day)
- Often (<1-3hours/day)
- Usually (3-5hours/day)
- Always (>5hours/day)

Online shopping frequency:

- Rarely (0-2 times/week)
- Often (2-5 times/week)
- Usually (5-10 times/week)
- Always (>10 times/week)

#### Part 2: Hypotheses testing.

*Please kindly indicate the extent to which you agree with each of the following statements by ticking ✓*

*Please use the following scale to answer each statements of the survey.*

1	2	3	4	5
Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree

Items		Agreement Extent				
1. Knowledge		1	2	3	4	5
1.1	You are familiar with using financial technology software like e-wallets and online banking.					
1.2	You frequently hear and read information about financial technology on TV and in publications.					
1.3	You are aware of how financial technology applications may be used to steal personal assets and information.					
1.4	You have enough understanding and knowledge about the financial technology applications (e-wallet, crypto currency...) you utilize.					
2. Affect		1	2	3	4	5
2.1	You are excited to use financial technology apps (online purchases and payments, international money transfer...)					
2.2	You like using financial technology applications because they are very convenient to shopping online, money transfer...					
2.3	When everyone around you uses financial technology apps, it makes you feel more comfortable and secure.					
2.4	When you use financial technology apps, you do not feel insecure and worried.					
3. Trust		1	2	3	4	5
3.1	You believe that the financial technology apps you utilize are safe and secure.					
3.2	You trust everyone around you, even people you have just met.					
3.3	You believe that the authorities and the manufacturer will be responsible for protecting and compensating when a cyber risk occurs.					
4. Risk perception		1	2	3	4	5
4.1	How do you think about this statement? "The possibility of cyber security risks when using financial technology apps is huge."					
4.2	How do you think about this statement? "Cyber security risks when using financial technology apps have serious consequences."					

4.3	How do you think about this statement? “The risk of cyber security (losing information and assets) when using fintech is higher than its benefit (low transaction fee, convenience...)”					
5. Precautionary Behavior		1	2	3	4	5
5.1	You learn more about cyber security methods before using a financial technology product.					
5.2	You increase your vigilance with some cases of cyber-attacks, especially those that have happened to relatives and friends.					
5.3	You avoid providing sensitive information when using untrusted financial technology applications.					
5.4	You check the application's security and seek user feedback on it before using.					

*Thank you for answering!*