



FACTORS AFFECTING THE USE OF FINTECH PAYMENT SERVICES BY STUDENTS OF UNIVERSITIES IN VIETNAM

BY

¹Thuy Thi Thanh Vu; ²Lan Thu Vu

^{1,2}University of Labour and Social Affairs, Vietnam



Article History

Received: 18/10/2023

Accepted: 23/10/2023

Published: 24/10/2023

Vol – 2 Issue – 10

PP: -57-69

Abstract

This study explores the main barriers affecting the use of FinTech companies' payment services on a sample of 550 students studying at universities in Vietnam. Four theoretical models suitable for the characteristics of FinTech were used in the study including: Technology Acceptance Model (TAM), Motivational Model (MM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Adoption of Technological Innovation Risk Model (ART). Based on the theoretical models and referencing previous studies, 14 variables were proposed for testing. Exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM) were used to measure and test the hypotheses. The results show that social influence and an individual's level of knowledge about FinTech are two factors that directly impact the use of FinTech companies' payment services.

Keywords: FinTech, influencing factors, payment, TAM, SEM

1. Introduction

The continuous development of science and technology in recent decades has brought changes in all aspects of life, especially in people's daily consumption habits. In the digital technology era, also known as the 4.0 revolution, convenience, efficiency, and speed are always put first, and payment via electronic devices like POS machines, smartphones, etc. has gradually replaced traditional payment methods as it shows many advantages while traditional methods exhibit many limitations. And a new concept was born - FinTech. FinTech is the abbreviation of Financial Technology, or translated into Vietnamese as financial technology. According to Schueffel (2016), FinTech is a new financial industry that applies modern technology to enhance financial activities. The essential contents of FinTech include the use of advanced technology aimed at improving financial service activities: making financial activities simpler, more convenient, economical, and comprehensive.

Currently, there are over 50 FinTech companies operating in Vietnam. These companies are especially dynamic in the payment sector, with over 40 FinTech companies operating in payments out of the total over 50 FinTech companies.

In 2008, the State Bank of Vietnam researched and began allowing many non-bank companies to provide payment services on a pilot basis to meet market development needs,

starting with Viet Phu Payment Service Support Joint Stock Company (MobiTV). After 6 years of piloting, in 2014, with Circular No. 39/2014/TT-NHNN (December 11, 2014), the State Bank officially licensed payment intermediary services. This is the premise for the explosion of electronic payment services in Vietnam in recent years. According to information published on the website of the SBV, as of October 30, 2022, there have been over 50 non-bank companies and organizations providing payment services in Vietnam.

Vietnamese youth, especially students in urban areas, are always known as a group representing creativity, leadership, and quick adaptation to modern technology trends in the world. In addition, they are also classified as a group with high spending and openness to e-commerce. With such characteristics, urban students have become a target group expected to lead the use of FinTech payment services. However, widely accepting and using a new technology is never simple, and there are often certain factors affecting access for any group. For this reason, this paper aims to identify factors influencing the use of FinTech payment services among students in cities.

2. Research overview

2.1. Research on FinTech

Over time, FinTech has increasingly demonstrated its outstanding utilities and advantages, demonstrated by the total global investment value in FinTech increasing from \$1.8



billion in 2010 to \$19 billion in 2010. 2015 (City Group, 2016), or according to the report "FinTech Adoption Index, 2017" (EY, 2017) of EY organization, in 2017 about 1/3 of global consumers are using two types of services. FinTech services or more, with 84% saying they know about FinTech (an increase of 22% compared to 62% in 2015).

Around the world, scholars have seen the potential of FinTech and conducted in-depth research, exploiting different aspects of FinTech. Shim & Shin (2016) analyze China's FinTech industry from the perspective of actor-network theory (ANT). Philippon (2017) assesses the potential impact of FinTech on the financial industry according to which FinTech can improve both financial stability and access to services but this requires significant changes in the focus of financial institutions. policy regulations. Nofie Iman's study of three case studies: Oi Paggo in Brazil, TCASH in Indonesia, and M-PESA in Kenya provides a perspective on the changing role and influence of payment services. phones in a period when FinTech payment types have exploded continuously (Iman, 2018). Studies on how countries apply FinTech to their economies include Fan's (2018) study on how Singapore has developed and regulated FinTech services.

We can mention a few studies on the Finetech aspect such as the study on the adoption of Fintech payment services, focusing on payment by phone by Kim et al. (2015) or the study on the adoption of Fintech payment services, focusing on payment by phone by Kim et al. use of FinTech services through generation groups by Carlin et al. (2017). According to Kim et al. (2015), by conducting analysis based on the ELM (Elaboration Likelihood Model) model of Petty and Cacioppo and the technology acceptance model (TAM), the two factors are convenience and usefulness. are the most important variables influencing usage decisions from the user's perspective, while from an institutional perspective, government regulation and increased security are the two decisive factors. to the extent of FinTech usage. The authors point out that for young people, lack of awareness of information is the main barrier leading to not using FinTech products. This is reflected in the responses of 53.2% of the 7,539 non-FinTech respondents. They say they do not use FinTech simply because they do not know about it (Gulamhuseinwala et al., 2015).

Vietnam is identified by McKinsey & Company as a potential market for FinTech development with a young population, a large proportion of smartphone users, and over 50% of the population connected to social networks. In-depth research on FinTech in Vietnam is quite limited. Up to now, a number of FinTech seminars have been organized in Vietnam, including two FinTech seminars conducted by the state bank, including Seminar: FinTech – development trends and recommendations to the State Bank of Vietnam on April 11, 2017, in Hanoi and the annual international conference sponsored by the State Bank on the topic "Banking and Fintech: Opportunities and Challenges" held on November 10 /2017. These are two big conferences, but they focus on discussing and researching FinTech in relation to banks, not specializing in FinTech. In addition, there are also a number of smaller-scale conferences on other topics such as virtual currency bitcoin, value chain, ... organized not for research purposes but as a way of promotion.

2.2. Theoretical basis for FinTech research

With the goal of building a model to determine factors affecting the use of FinTech payments among students in Vietnam, the following section summarizes appropriate theories for the characteristics of FinTech including the Technology Acceptance Model (TAM), the Motivational Model (MM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the Adoption of Risk in Technology (ART) model. Based on the above theoretical models, the research model will be built and research hypotheses will be proposed.

2.2.1. Technology Acceptance Model (TAM)

In the late 20th century, the Technology Acceptance Model (TAM) (Davis, 1989) was first constructed and is an expanded, developed model of the Theory of Reasoned Action (TRA), one of the most fundamental theories in studying human behavior. The theory of reasoned action was built from 1967 and expanded and refined over time from the early 1970s by Ajzen & Fishbein (1980). According to TRA theory, an individual's behavioral intention determines actual behavior, and in turn, it is determined by attitude toward the behavior along with subjective norms.

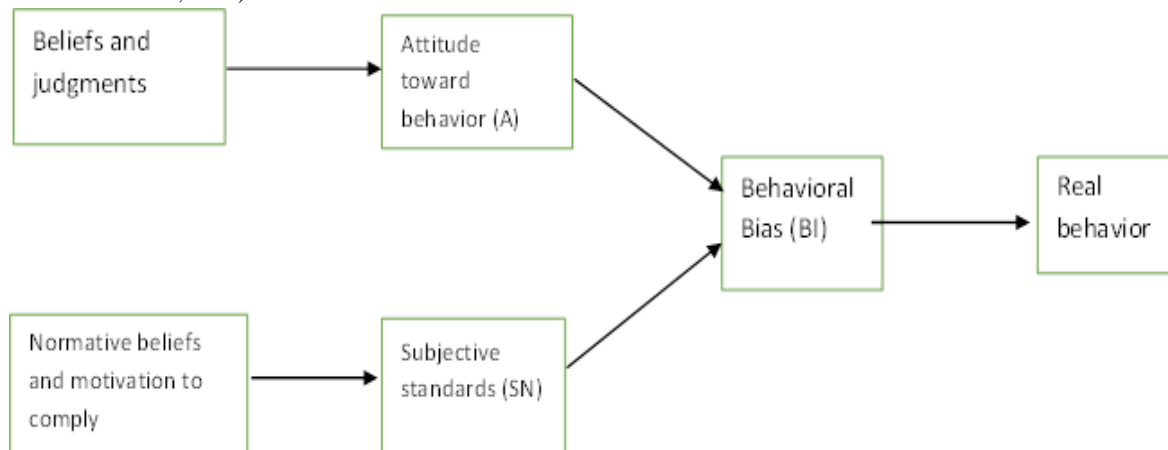


Figure 2: Theory of Reasoned Action (TRA)

(Source: Schiffman & Kanuk, 1987)

As seen in Figure 2, the Theory of Reasoned Action is based on the premise that humans are very objective and rational: they decide to perform an action by considering the outcomes the action may bring. For example, a shopper's attitude will be measured by that person's perception of the attributes of the product they intend to buy. At this time, they will pay more attention to attributes that provide necessary benefits and prioritize the importance between benefits. Therefore, if the weights of those attributes are known, the shopper's choice outcome can be approximately predicted. With this basis, TRA theory has encountered many limitations such as

ignoring the importance of social factors which in reality can be a decisive factor for individual behavior (Grandon & Peter, 2004) or factors affecting individual objectivity and decision-making habits: unconscious motivations, personality, and demographics (Armitage, 2001).

The Technology Acceptance Model (TAM) was built on the basis of TRA theory, similarly describing that an individual's actual behavior is mainly determined by behavioral intention, which has somewhat overcome the disadvantages of TRA by pointing out the impact of external factors on internal factors of beliefs, attitudes, and intentions (Davis, 1989).

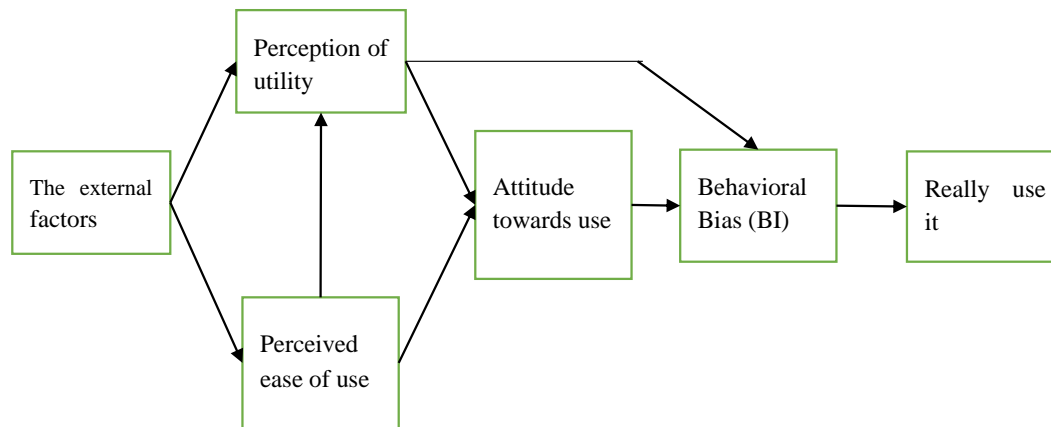


Figure 3: Technology acceptance model (TAM)

(Source: Davis, 1989)

The TAM model has been widely used in research on technology acceptance such as a study on acceptance of mobile payment services (Wu & Wang, 2005), various types of e-tickets (Mallat et al., 2009), or e-commerce (Smith et al., 2014),... The two variables of perceived usefulness and perceived ease of use in TAM are considered the core factors in explaining usage behavior. Legris et al.'s (2003) research also points out that the TAM model and TAM2 by Venkatesh & Davis (2000) can explain 40% of technology use.

However, the TAM model still faces issues of lacking practical value and limited explanatory power (Chuttur, 2009). To mitigate this disadvantage, according to many researchers, the TAM model should be placed in a broader model along with organizational and social factors (Legris et al., 2003).

The TAM model is quite commonly used in Vietnam to measure the adoption of a new technology. Some research in Vietnam using the TAM model includes a study on the motivations for using Internet Banking by consumers in Da Nang (Tuyet, 2011) or the research of Kieu & Mang (2011) using TAM to study factors affecting satisfaction with the quality of Internet Banking services for individual customers.

2.2.2. Improved Diffusion Theory (IDT)

The Improved Diffusion Theory (IDT) describes how innovations or technologies become accepted and spread through society on a large or small scale (Rogers, 2003). According to the improved diffusion theory, an entire process

is needed to arrive at the decision to adopt. This process is called the innovation-decision process (Demir, 2006) and the whole process will be placed in 5 stages: the knowledge stage, the persuasion stage, the decision stage, the implementation stage, and the confirmation stage.

The first stage is called the knowledge stage. At this stage, individuals will be exposed to technology and explore it. Three types of knowledge are identified in this stage: awareness-knowledge, how-to-knowledge, and principles-knowledge of the technology concepts such as how the Internet works. The second stage is persuasion. At this stage, individuals will look for information related to technology, evaluate the attitudes of people around them, peers about that technology. There may be both supportive and skeptical attitudes, but the attitude itself does not always determine use or non-use. Sometimes an affirmative attitude has no significance in decision making and this is called the knowledge-attitudes-practice (KAP) gap. The third stage is decision. A sign to recognize when someone is in this stage is when that person is taking actions that lead to whether or not to use the technology. This action is often just trying it out because individuals always tend to try out technology for a short period of time or on a small scale before officially using it. This is an opportunity for them to test whether they can achieve benefits from using the technology. If so, the level of acceptance of use will increase dramatically. Most rejection of use comes from this stage. After the third stage, if the individual decides to use it, they will enter the fourth stage - the implementation stage. In the implementation stage, the

individual will actually use the new technology for the first time and many issues related to whether or not to continue using it will occur at this stage. The final stage is the confirmation stage. At this stage, new users will seek information and advice to reinforce their choice. If they find too much inappropriate information or contradictory information, they may decide not to continue using it. Once an individual decides to discontinue use, two cases occur. The

first case, also called replacement discontinuance, occurs when that individual looks for and replaces that technology with another technology that they find more appropriate or superior. The second case occurs when that individual loses faith in the technology, they feel the technology does not meet the standards and ideas they had thought of so they simply stop using the technology. This case is called disenchantment discontinuance (Rogers, 2003).

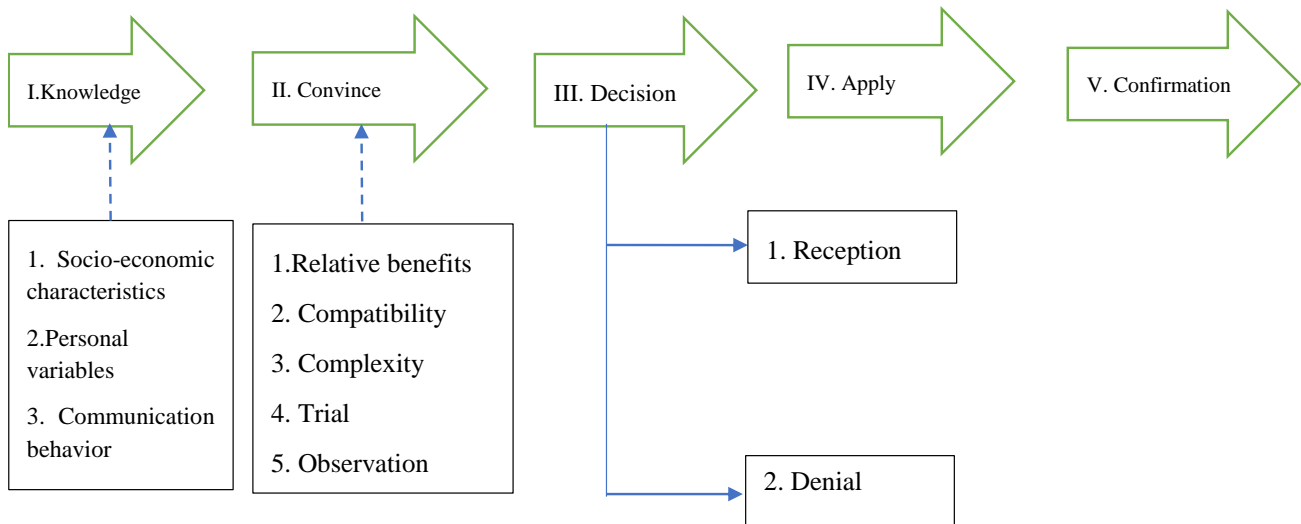


Figure 4: 5-stage model in the innovation-decision process

Source: Rogers (2003)

In addition to placing the technology adoption process into five stages, examining the specific characteristics that influence each stage is also an important issue. There are 3 characteristics in the decision-making process: socio-economic characteristics, personality characteristics, and communication behavior. There are 5 perceived characteristics of innovation: relative advantage, compatibility, complexity, trialability, and observability.

When looking at the diffusion of technology, it should be recognized that each individual has different technology adoption. IDT has provided some frameworks to evaluate individuals. They can be divided into five groups: innovators, early adopters, early majority, late majority, and laggards.

In addition, the Improved Diffusion Theory also has many limitations. IDT explains the decision-making process to use innovations by identifying factors that influence adoption and by classifying adopting individuals. While IDT supports predicting adoption rates (Agarwal & Prasad, 1998), it does not provide evidence of how the characteristics of innovation can be applied to the decision-making process and how these decisions are shaped by attitudes Karahanna et al. (1999). Although Rogers (2003) explained that attitudes are formed through acquired knowledge, he did not fully explain how the attributes of innovation help shape attitudes. Notably, while IDT and TAM were developed from distinct principles, they both have common attributes. Most notably, perceived usefulness in TAM is similar to relative advantage in IDT,

and perceived ease of use is analogous to complexity in IDT (Tung et al., 2009).

2.2.3. Motivation Model

There have been many studies on motivation theories in psychology to explain human behavior through internal and external motivations of individuals, but the Self-Determination Theory (SDT) proposed by Deci & Richard (1985) in 1985 is perhaps the most popular approach. This theory introduces the classification of motivation into 3 types: external motivation, internal motivation, and no motivation; at the same time divides external motivation into 4 levels, arranged in order of autonomy from low to high (Hãng, 2010). In 1992, Davis, Bagozzi, and Warshaw were the first to apply the motivation model to explain computer use in the workplace (Fred D. Davis, 1992), which created a wave of applying the motivation model in researching factors affecting technology adoption. We can name many technology adoption studies applying the motivation model such as a study on the use of computer technology on a sample of 450 managers in Finland by Igbaria, Iivari, and Maragahh (Igbaria, 1995), a study on Internet usage in Singapore by (Teo, 1999) or a study on the adoption of e-learning methods in schools and workplaces in Korea by (Yoo, 2012).

Two commonly used motivation factors are perceived usefulness as an example of external motivation and perceived enjoyment as an example of internal motivation. These two factors have been tested through many studies and yielded favorable results. As in Davis's study (Fred D. Davis, 1992),

he and his research team concluded that these two factors had a significant impact on the decision to use computers.

The motivation model can be considered as another typical model, an example of models widely applied in information systems originating from psychological theories, similar to the Theory of Reasoned Action (TRA) or the SDT theory.

2.2.4. Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) was established based on 8 previous models and theories, including: Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), TAM model (Davis, 1989), Motivation Model (Davis, et al., 1992; Venkatesh & Speier, 1999), Theory of Planned Behavior (TPB) (Ajzen, 1991), C-TAM-TPB model (a model combining TAM and TPB) (Taylor and Todd, 1995), MPCU model (Thompson, Higgins & Howell, 1991), IDT theory (Rogers, 1995), Social Cognitive Theory (SCT) (Bandura, 1986).

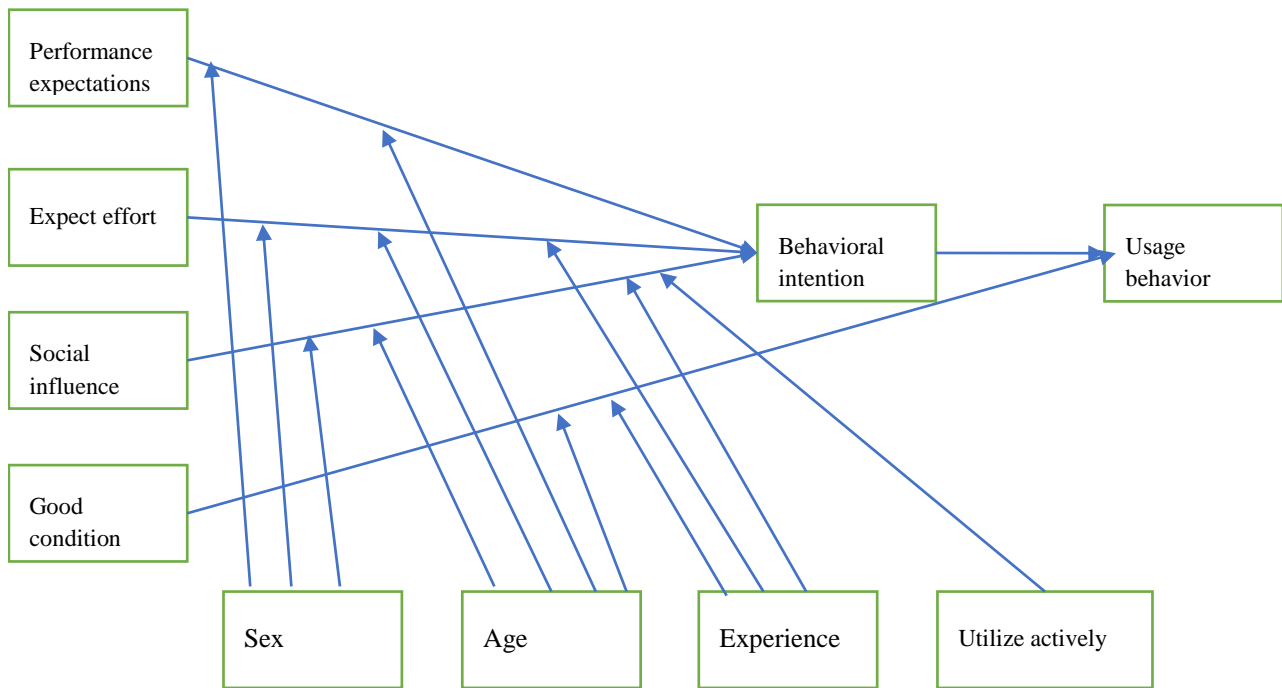


Figure 5: Unified theoretical model of technology acceptance and use

Source: Venkatesh V. M., (2003)

UTAUT inherits the strengths of the 8 previous models, combining them with the goal of establishing the most unified perspective for studying user acceptance of new information systems, especially commonly applied in technology adoption research. According to Venkatesh’s study (Venkatesh V. M., 2003), the UTAUT model was confirmed to be able to explain up to 70% of usage intention. However, Bagozzi (2007) pointed out some disadvantages of this model such as 41 independent variables to predict intentions and 8 independent variables to predict behavior, not to mention possibly overlooking some other important independent variables, leading to confusion. And this narrowed the representativeness of each specific technology or in other

words, the unique characteristics of each specific technology were limited and could not be expressed.

2.2.5. Technology Acceptance Risk Model (ART)

FinTech is not just a new technology but more importantly, it is a new payment method. Therefore, when researching the adoption of FinTech, we need to look at it from both perspectives - the adoption of a new technology and the adoption of a new payment method. When studying the adoption of a new payment method, we cannot ignore the impact of potential financial risks. In a study on mobile banking services (Gupta, 2010), Gupta and Xu mainly studied the impact based on risk factors. With this study, they concluded that technology risk and perceived security directly affect usage intention, in which the impact of perceived security has a stronger effect than technology risk.

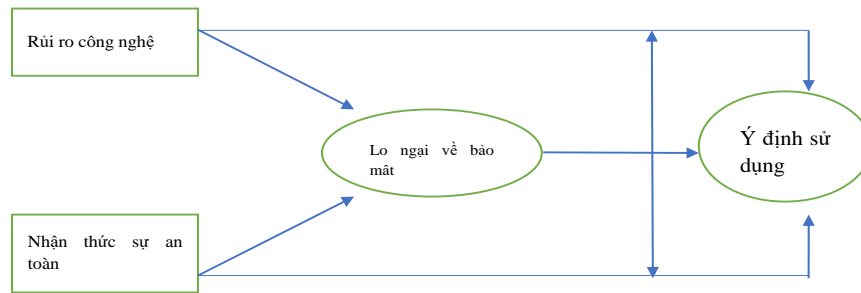


Figure 6: Technology Acceptance Risk Model

Source: (Gupta, 2010)

Gupta's Technology Acceptance Risk (RTA) model clarified the difference between risk and security issues. This both filled a gap in previous research and provided practical guidance for future research on technology adoption risk. However, a limitation of the model is that it overlooks privacy considerations which are likely a key factor to include in a technology risk research model.

3. Research Methodology

3.1. Research Model and Hypotheses

3.1.1. Building the Research Model

Based on the theoretical background presented above and research practices, the authors have built a research model with 14 factors including Perceived Usefulness (PU), Perceived Ease of Use (PEU), Price Value (PV), Social Influence (SI), Perceived Need for Minimalism (PNM), Perceived Enjoyment (PE), Security Concern (SC), Perceived Familiarity (PF), Inadequate Problem Handling of FinTech Companies in Adverse Situations (IBS), Concerns about Technical Issues when Using New Technologies (TC), Personal Knowledge (PK), Alternative Options (OP), Personal Circumstances (PC) and Usage Intention (INT). Each factor will be measured through observational variables shown in the questionnaire.

The research uses Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and SEM network modeling to measure the impact of factors on the observational variable INT.

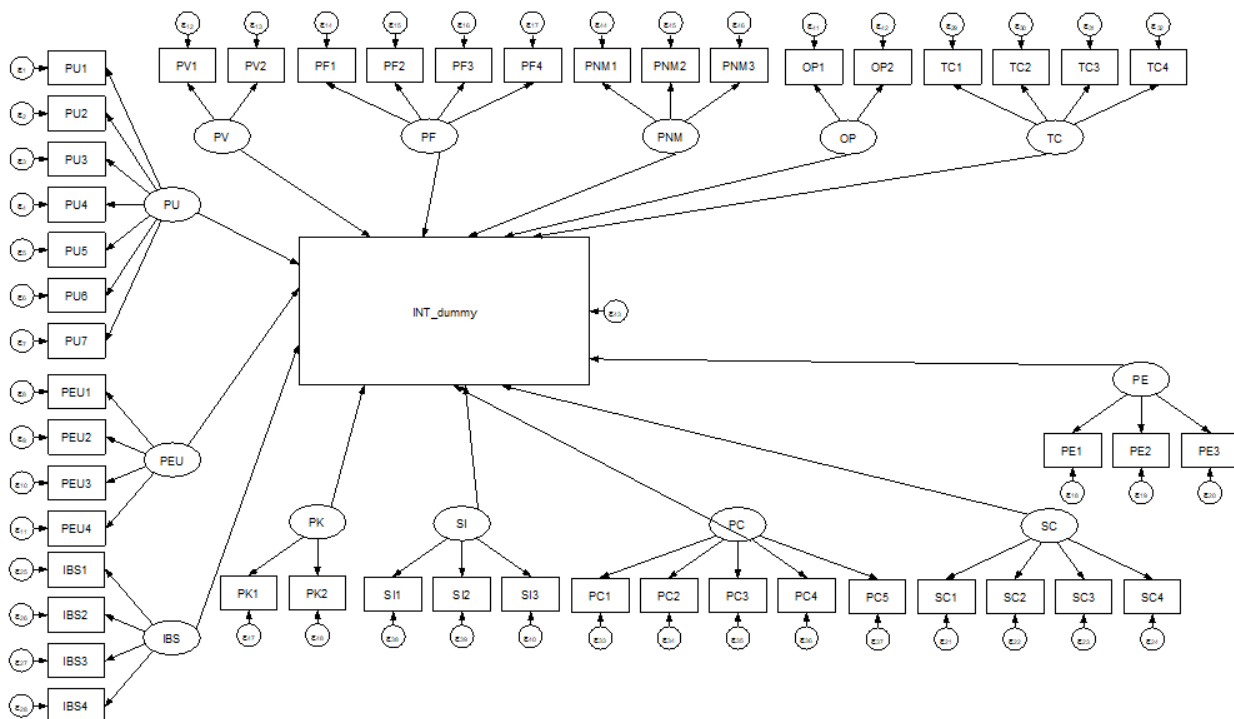


Figure 7: Research Model

3.2.1. Research hypotheses

In his research paper, Davis (1989) defined perceived usefulness (PU) as "the degree to which a person believes that

using a particular system will improve job performance" (Davis, 1989). Agreeing with Davis, Venkatesh also considers PU as a level that a person believes a system can bring to

work. (Venkatesh V. M., 2003). There are many research articles that have shown a strong impact of PU on intention to use technology. According to (Venkatesh V. M., 2003), PU has been proven to be the strongest predictor of intention to use in different fields. In research on adoption When using online banking services, Pikkarainen and colleagues found that PU is one of the most influential factors to explain usage intention (Pikkarainen, 2004).

H1: Perceived usefulness (PU) will have a positive influence on users' intention to use.

PEU is considered user-friendliness based on external variables such as user attitudes, system features, training, user manuals, user consultation, etc. According to Rigopoulos and Askounis, in the article Research on new usage methods, PEU has a positive impact on perceived usefulness (PU) and intention to use, in which the impact on perceived usefulness is stronger (Rigopoulos, 2007). In particular, the impact of PEU on PU is also explained as an indirect way of influencing intention to use. Research by (Fagan, 2008) also shows the positive impact of PEU on PU and intention to use.

H2a: Perceived ease of use (PEU) will have a positive influence on users' intention to use.

H2b: Perceived ease of use (PEU) will have a positive influence on perceived usefulness (PU).

Perceived value (PV) is defined as the user's perception of the trade-off between the benefits that technology brings and the amount of money spent. (Venkatesh V. T., 2012). When the benefits that individuals receive are greater than the monetary costs they have to spend, the variable of perceived value (PV) will have a positive impact on intention to use. (Venkatesh V. T., 2012) Xu's research paper on online games also shows that PV has a positive impact on intention to use and service continuance. (Xu, 2014).

H3: Price value (PV) will have a positive influence on user intention to use.

Social influence (SI) is defined as the influence of people important to that individual such as friends, family members, etc. on the individual's adoption of new technology.

(Venkatesh V. M., 2003). Especially with financial-related products, users often consider much more carefully before using them because they always have invisible worries about losing money. Thus, in addition to self-study, the advice, opinions, and experiences of those around you (especially close people) can reduce doubts and increase trust in payment products. new like FinTech. Some studies that show positive results of social influence on usage intention include Wu & Wang's research on factors affecting mobile commerce (Wu J. H., 2005); or research on FinTech adoption by Kim, Park, Choi, and Yeon (Kim, Park, Choi, & Yeon, 2015)

H4: Social influence (SI) will have a positive influence on users' intention to use.

The simplified lifestyle has recently become quite popular. People who like minimalism believe that life will be more enjoyable when there are less unnecessary things. (Jay, 2010)

According to Novak, the need for a simple lifestyle can lead to a demand for products that can make life simpler and tidier. (Novak, 2010) And this is also one of the things that FinTech services aim for. Therefore, the perceived need for minimalism is expected to have a positive influence on the intention to use FinTech.

H5: Perceived need for minimalism (PNM) will have a positive influence on users' intention to use.

As mentioned in the motivational model, individuals may perform a particular behavior because of the urge that it is enjoyable (Deci, 1985), and this can also be extended to the adoption of technology. As such, individuals may intend to use technology because it is interesting or fun. There are many studies that have been conducted and proven the correctness of the above statement. It can be mentioned as the research on the intention to use the Internet by Moon and Kim. In this research, Moon and Kim showed that perceptions of entertainment, including concentration, curiosity, and fun, have a great influence on the intention to use the Internet. (Moon, 2001) Research by Teo, Lim, Lai also concluded that the two factors that have the strongest impact on intention to use are perceived usefulness and followed by perceived fun. (Teo, 1999)

H6: Perception of pleasure (PE) will have a positive influence on user intention to use.

In their research, Suh and Han pointed out that security is one of the biggest challenges facing e-commerce service providers. (Han, 2003) Research by Roboff & Charles shows that customers often have a lot of trust in banks but do not have trust in technology in financial matters. (Roboff, 1998) In addition, according to Pavlou et al., adoption rates will increase if customers feel they have control over the contract. (Pavlou, 2007). Thus, security concerns are expected to have a negative impact on usage intention.

H7: Security concerns (SC) will have a negative influence on users' intention to use

Information perception (PF) is defined as the amount of information that a service provider provides to customers. When users see that they have information about the company and product they are using, they tend to be more confident in using it. This can be seen as a factor that helps increase user trust. Therefore, PF is expected to have a positive impact on users' intention to use. According to (Sathye, 1999), in 1999, online banking services were still new and few people used them. With her research, Sathye found that one of the biggest barriers to adopting electronic banking is due to the lack of information awareness of potential customers. Gulamhuseinwala and his colleagues also pointed out in their research on young people's adoption of FinTech that lack of awareness of information is the main barrier leading to not using FinTech products. This is reflected in the responses of 53.2% of the 7,539 non-FinTech respondents. They say they don't use FinTech simply because they don't know about it. (Gulamhuseinwala, Bull, & Lewis, 2015)

H8: Perceived information (PF) will have a positive influence on users' usage intention.

In addition to providing good quality services at reasonable prices, customer care is also an important issue that can affect whether an individual will continue using the service. The research of Ha and Park has pointed out that one of the decisive factors for continued usage intention is customer satisfaction (Ha, 2013). Increasing satisfaction by meeting the needs and demands of customers is one of the top concerns in the fields of marketing, consumer behavior as well as information systems (Bhattacharjee, 2001). When bad incidents like transaction errors occur, if the service provider resolves the issue unprofessionally, slowly, or shirks responsibility, it will make users feel dissatisfied and this may cause them to decide to discontinue using the service. The variable of poor problem handling by FinTech companies when bad situations occur (IBS) has not appeared in previous studies and is included by the author based on the author's practical experiences and feedback from interviewees.

H9: Poor problem handling by FinTech companies when bad situations occur (IBS) will have a negative influence on users' usage intention.

When using new technology, concerns about technical issues are inevitable. Through researching the questions and feedback that users send to the technology service provider, the author realizes that concerns about technical issues when using new technology (TC) are a potential variable and likely to influence usage intention.

H10: Concerns about technical issues when using new technology (TC) will have a negative influence on users' usage intention.

When an individual has a certain level of understanding about FinTech and FinTech services, that individual is hypothesized to have more trust and greater usage intention compared to someone who is still vague about FinTech. The more knowledge one has, the higher usage intention one is expected to have. An individual's level of knowledge about FinTech payment services (PK) is measured by two questions: "I fully understand the benefits of FinTech payment" and "I have sufficient knowledge about FinTech payment services".

H11: Personal knowledge (PK) will have a positive influence on users' usage intention.

During the research process and field surveys, the author has noticed a situation where many respondents have confused FinTech with BankTech services like mobile banking, internet banking or only knew about BankTech services without knowing about FinTech. Therefore, the author hypothesizes about other options (OP). According to this hypothesis, when users are already using other services with relatively similar functions (mobile banking, internet banking, etc.) or other options they find more familiar (like cash payment), they will tend to not use FinTech payment. Thus, the OP variable is expected to have a negative impact on FinTech usage intention.

H12: Other options (OP) will have a negative influence on users' usage intention.

Personal issues like reluctance to learn about technology, finance, lack of devices (e.g. smartphones, tablets, etc.) to use FinTech payment, or individuals' dislike of trying new technologies are all assessed by the author as potentially influencing usage intention. This is similar to the internal drivers of intention in the Motivation Model (MM).

H13: Personal concerns (PC) will have a negative influence on users' usage intention.

3.2. Data

3.2.1. Survey questionnaire design

The survey questions were built based on the author's observations and research on the current state of FinTech payments in Vietnam, as well as previous studies. Question sets based on previous research include three questions about simple lifestyle adapted from Jay (2010)'s study, or three questions about social influence based on Thompson et al. (1991) and Davis (1989)'s studies, etc. The question sets developed by the author group through practical research include questions about personal issues (PC), questions about poor problem handling by FinTech companies when bad situations occur (IBS), questions about concerns over technical issues when using new technology (TC), questions measuring personal knowledge (PK) and questions about other options (OP).

The 5-point Likert scale was applied to all questions to measure respondents' opinions on the questions in detail. 1 is "Strongly disagree", 2 is "Disagree", 3 is "Neutral", 4 is "Agree", and 5 is "Strongly agree".

The survey questionnaire was designed based on variables in the model and finalized through pre-interviewing target groups and consulting finance experts to ensure the questions are correctly understood. The questionnaires went through 3 rounds of revisions, by taking into account contributions from pre-interview respondents as well as limitations encountered during pre-interviews that the author noticed.

3.2.2. Data collection and description

There were 580 questionnaires distributed via Google Forms and direct interviews of university and college students in Hanoi including National Economics University, Hanoi

University, Post and Telecommunication Institute of Technology, University of Labour and Social Affairs, etc. with convenience sampling method. After collection, the questionnaires were checked to review and eliminate low-quality responses. As a result, after eliminating incomplete questionnaires, there were 550 valid questionnaires left.

The data will be processed using Stata14 software. Data analysis will be conducted through the following steps: (1) preliminary assessment of measurement scales and reliability of measured variables using Cronbach's Alpha coefficients and factor loadings through exploratory factor analysis (EFA), (2) followed by using confirmatory factor analysis (CFA) techniques for stricter testing of unidimensionality, validity

(convergence, discrimination) of each factor (3) calculating the strength of motivational factors.

Based on statistics, the percentage of males is 45% and females is 55%, so the gender ratio can be considered quite balanced. The age group with the highest percentage is 20 years old at 35%, and the lowest is 19 years old at 7%. The percentage of students with part-time jobs is higher than those without part-time jobs, at 63%. For income, most are concentrated at 1 to 3 million VND/month at 45% and no income at 43%. For field of study, Information Technology, Economics - Finance - Accounting, and Other fields are 12%, 35%, and 45% respectively.

| | No | Percentage (%) |
|--|-----|----------------|
| Sex | | |
| Male | 248 | 45% |
| Female | 302 | 55% |
| Age | | |
| 19 | 44 | 8% |
| 20 | 193 | 35% |
| 21 | 149 | 27% |
| 22 | 121 | 22% |
| 23 | 43 | 8% |
| Employment status | | |
| Do not work part-time while a student. | 187 | 34% |
| Work part-time while a student. | 363 | 63% |
| Income | | |
| No income | 236 | 43% |

| Variable | OP | PU | PEU | PV | PF | PE | SI | SC | TC | IBS | PK | PC | PNM |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| α | 0.45 | 0.81 | 0.84 | 0.57 | 0.70 | 0.75 | 0.70 | 0.83 | 0.71 | 0.82 | 0.72 | 0.67 | 0.66 |

Table 2: Results of Cronbach's Alpha Index

After running the model, based on the results of Cronbach's Alpha index in table 2, the author proceeds to eliminate latent variables with Cronbach's Alpha index < 0.7. These are the variables Perceived Value (PV), Perceived Need for Minimalism (PNM), Other Options (OP), and Personal Issues (PC).

Eight factors were formed after performing EFA, however, according to the rotated matrix results, we can see the variables TC (concern about technical issues when using new technology) and IBS (problem handling). FinTech companies' poor performance when bad situations occur are all explained by the same factors. This can be explained by reviewing the

| | | |
|------------------------------------|-----|-----|
| From 1 to 3 million VND/month | 248 | 45% |
| From 3 to 6 million VND/month | 44 | 8% |
| From 6 to 10 million VND/month | 22 | 4% |
| Majors | | |
| Information technology | 72 | 13% |
| Accounting, Finance, and Economics | 215 | 39% |
| Other sectors | 263 | 48% |

Table 1: Characteristics of the study sample

4. Analysis results

Before conducting factor analysis, we check the KMO index. According to Kaiser-Meyer-Olkin, if the KMO index is between 0.5 and 1, the model is considered acceptable. (Kaiser, 1974)

In the study, KMO index = 0.5924. This means that the variables in the data set are related to each other and therefore EFA exploratory factor analysis is meaningful.

EFA exploratory factor analysis:

In EFA analysis, the way to check reliability is to calculate Cronbach's Alpha for each factor. It is known as a consistency convention and is considered the most widely used reliability coefficient in academic research. (Osborne, 2008). The value of Cronbach's Alpha ranges from 0 to 1. Cronbach's Alpha value below 0.5 is considered unacceptable, from 0.5 to 0.6 is poor, from 0.6 to 0.7 is acceptable, from 0.7 or more is appropriate. (George, 2000)

questions about the two variables TC and IBS in the questionnaire.

(TC1) FinTech companies' servers processing payment transactions may be inaccurate.

(TC2) FinTech companies' servers may have errors (for example: system errors, transactions take a long time to complete, cannot log in...).

(TC3) When paying with FinTech, if an error occurs, it will take a long time to fix.

(TC4) FinTech software/application conflicts with other software/applications on the same device.

(IBS1) When a transaction error occurs, the Fintech payment company can deny responsibility.

(IBS2) When a transaction error occurs, the Fintech payment company handles it unprofessionally (for example: poor attitude, slow response...).

(IBS3) When a transaction error occurs, the Fintech payment company cannot handle the problem.

(IBS4) Payment by FinTech will incur unexpected additional fees.

We see the questions TC1 TC2 TC3 and IBS1 IBS2 IBS3 IBS4 all aim at the same problem: hypotheses when a bad technological situation occurs. So the factor that explains both these variables can be called the bad situation. However, there is still a difference between these two variables: TC presents technology problems, or in other words, lists possible technology errors, while the IBS variable refers to how FinTech companies deal with problems. The technology issues raised in TC variables occur or are part of customer care work.

Such a result partly shows the shortcomings in the way the question is asked when it fails to clearly highlight the message of the variable. This is also a finding that contributes to completing the questionnaire in the next study.

Thus, only 7 factors were formed, including Perceived usefulness (PU), Perceived ease of use (PEU), Perceived fun (PE), Security concerns (SC), Information Perception (PF), Bad Situations (TC and IBS), Personal Knowledge (PK) and Social Influence (SI)

4.1. CFA confirmatory factor analysis:

| | | β | P | Direction of impact | Result |
|-----|------------------|----------|-------|---------------------|---|
| H1 | PU -> INT_dummy | .023289 | 0.865 | (+) | The study offers no evidence to support a theory. |
| H2a | PEU -> INT_dummy | .1387299 | 0.218 | (+) | The study offers no evidence to support a theory. |
| H2b | PEU -> PU | .2784357 | 0.019 | (+) | Support for a research hypothesis |
| H3 | PV -> INT_dummy | - | - | | The study offers no evidence to support a theory. |
| H4 | SI -> INT_dummy | .3684267 | 0.005 | (+) | Support for a research hypothesis |
| H5 | PNM -> INT_dummy | - | - | | The study offers no evidence to support a theory. |
| H6 | PE -> INT_dummy | .1100823 | 0.009 | (+) | Support for a research hypothesis |
| H7 | SC -> INT_dummy | .1820021 | 0.164 | (+) | The study offers no evidence to support a theory. |
| H8 | PF -> INT_dummy | .0194317 | 0.874 | (+) | The study offers no evidence to support a theory. |
| H9 | IBS -> INT_dummy | - | - | | The study offers no evidence to support a theory. |
| H10 | TC -> INT_dummy | .021844 | 0.068 | (+) | Support for a research hypothesis |
| H11 | PK -> INT_dummy | .2385512 | 0.070 | (+) | Support for a research hypothesis |
| H12 | OP -> INT_dummy | - | - | | The study offers no evidence to support a theory. |
| H13 | PC -> INT_dummy | - | - | | The study offers no evidence to support a theory. |

Table 4: Hypothesis testing results

Confirmatory factor analysis CFA was performed with 35 observed variables with 7 factors proven from exploratory factor analysis (EFA).

| Index | Values of the model's indexes | The reference value of the model is good |
|---------|-------------------------------|--|
| p-value | 0.000 | > 0.05 |
| CFI | 0.789 | > 0.9 |
| TLI | 0.768 | > 0.9 |
| RMSEA | 0.077 | < 0.05 |
| Pclose | 0.001 | > 0.05 |
| SRMR | 0.147 | < 0.05 |

Table 4: Indicators showing the appropriateness of the research model

4.2. Evaluate the SEM model

4 latent variables (PV, PNM, PC, OP) were eliminated during EFA analysis and one latent variable (IBS) and one observed variable (PU7) were eliminated during the process of adjusting the suitability of model. Therefore, there are only 8 latent variables and 31 observed variables left for the SEM model. This last model is acceptable not only because of the high factor loadings of the items but also based on model fit indices. Due to the limitation of the research sample and the complexity of the network model, the final model may not be perfect for each indicator, but the NFI, TLI, and CFI indexes are all higher than 0.7. This demonstrates adequate coverage and acceptable results.

Through Table 4, we see that only 3 variables have p-values that meet the standard: SI variable ($p=0.005$), PK ($p=0.070$); PE ($p= 0.09$), and TC ($p = 0.068$). This shows that social influence, personal knowledge, and technical factors are two main barriers in the adoption of FinTech payment among university students in Vietnam.

Social influence in this study is measured by the influence of family members, friends, and organizations where individuals work. The fact that social influence is positively related to usage intention also partly reflects that individuals will be more strongly influenced by advice and experiences of people around them. It also shows that individuals are more easily attracted if they see people around them using FinTech payment. This also partly reflects the cultural characteristics and lifestyles of Vietnamese people.

Regarding personal knowledge, according to the results in Table 4, the higher the level of knowledge about FinTech, the higher the intention to use FinTech payment. This shows that individuals are often hesitant towards a new service that they do not know much about. Knowledge here can be gathered from many sources, including both good and bad information, but when individuals have sufficient understanding of FinTech, the influence of negative information will be reduced to some extent because those individuals can analyze and understand how to accept risks. Thus, trust will increase to some extent, leading to an increase in usage intention.

Perception of information is also one of the barriers to increasing FinTech usage.

In addition to the 4 variables of PK, SI, TC, and PE, the impact of PEU on PU is also very positive ($p=0.019$). This shows that the perception of ease of use has a positive impact on the perception of usefulness, similar to the results of previous studies. However, since the impact of PU on usage intention (INT) is very weak ($p=0.865$), PEU cannot indirectly demonstrate an impact on usage intention through PU.

4. Conclusions and recommendations

This study has identified 7 factors affecting students' intention to use Fintech among university students in Vietnam, of which the two variables with the strongest positive impact are social influence (SI) and personal knowledge level about FinTech (PK). On that basis, the authors make the following recommendations. For FinTech companies, in order to attract young users, it is necessary to carry out campaigns introducing the characteristics of FinTech payment services, its benefits, and how to use it to help users increase their understanding of FinTech. FinTech companies should propose and build programs for families, groups or offer promotional campaigns when using by family or group since FinTech users are strongly influenced by the opinions of those around them. Similarly, for regulators, in order to expand the use of FinTech among students in particular and young people in general, it is necessary to focus on enhancing knowledge about FinTech while creating a ripple effect in society so that everyone can participate in this type of service.

This is one of the first studies identifying barriers to using FinTech among students, creating a premise for larger-scale research with more diverse subjects in the future. The limitation of the study is that the research sample is still relatively small compared to the number of research variables. In addition, the study has only focused on the group of students in universities in Vietnam.

Future research should select samples randomly with a larger sample size, not just stopping at one province or city but collecting data from many places so that the results are more representative. Subsequent research should focus on a higher level, which is comparing the motivation to use services between different customer groups, for example, those who have used the service and those who have not.

REFERENCES

1. Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. New York: Englewood Cliffs.
2. Armitage, C. J. (2001). Efficacy of the Theory of Planned Behaviour: a meta-analytic review. *British Journal of Social Psychology*, 4(40), 471 - 499.
3. Bhattacharjee, A. (2001). Understanding information systems continuance: an expectation-confirmation model. *MIS Quarterly*, 25(3), 351-370.
4. Carlin, B., Olafsson, A., & Pagel, M. (2017). FinTech Adoption Across Generations: Financial Fitness in the Information Age. *NBER Working Paper No. 23798*, 1-42.
5. Chuttur, M. (2009). Overview of the Technology Acceptance Model: Origins, Developments and Future Directions. Indiana University, *Sprouts: Working Papers on Information Systems*, 9(37), 1-19.
6. City Group. (2016). Digital disruption, how FinTech is forcing banking to a tipping point. City Group.
7. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
8. Deci, E. L. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. New York: Plenum.
9. Demir, K. (2006). Rogers' theory of the diffusion of innovations and online course registration. *Educational Administration: Theory & Practice*, 47, 386-392.
10. EY. (2017). *FinTech Adoption Index*. EY.
11. Fagan, M. H. (2008). Exploring the Intention to Use Computers: An Empirical Investigation of the Role of Intrinsic Motivation, Extrinsic Motivation, and Perceived Ease of Use. *Journal of Computer Information Systems*, 8(3), 31-37.
12. Fan, P. S. (2018). Chapter 15 – Singapore Approach to Develop and Regulate FinTech. In *Handbook of Blockchain, Digital Finance, and Inclusion* (Vol. 1, pp. 347-357). Academic Press.

- doi:<https://doi.org/10.1016/B978-0-12-810441-5.00015-4>
13. Fred D. Davis, R. B. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace1. *Journal of Applied Social Psychology*, 22(14), 1111 - 1132.
 14. George, D. &. (2000). SPSS for Windows step by step: a simple guide and reference. (3rd ed.). Allyn & Bacon.
 15. Grandon, M., & Peter, P. (2004). Theory-Based Instrumentation to Measure The Intention To Use Electronic Commerce in Small and Medium-Sized Bussiness. *The Journal of Computer Information Systems*, 44(3), 44-57.
 16. Gulamhuseinwala, I., Bull, T., & Lewis, S. (2015). "FinTech is gaining traction and young, high-income users are the early adopters". *EY Global Financial Services Institute Winter*, 3(3), 5-17.
 17. Gupta, S. &. (2010). Examining the Relative Influence of Risk and Control on Intention to Adopt Risky Technologies. *Journal of Technology Management & Innovation*, 5(4), 23-33.
 18. Ha, Y. a. (2013). Antecedents of customer satisfaction and customer loyalty foremerging devices in the initial market of Korea: an equity framework. *Psychology & Marketing*, 30(8), 676-689.
 19. Han, B. S. (2003). The Impact of Customer Trust and Perception of Security Control on the Acceptance of Electronic Commerce. *International Journal of Electronic Commerce*, 7(3), 135-161.
 20. Igbaria, I. M. (1995). Why do individuals use computer technology? A Finnish case study. *Information & Management*, 29, 227-238.
 21. Iman, N. (2018). Is mobile payment still relevant in the fintech era? *Electronic Commerce Research and Applications*.
 22. Jay, F. (2010). *The Joy of Less: A Minimalist Living Guide: how to Declutter, Organize, and SIMplify Your Life*. Anja Press.
 23. Kaiser, H. (1974). An index of factorial simplicity. *Psychometrika*, 39, 31-36.
 24. Karahanna, E., Straub, D., & Chervany, N. (1999). Information TechnoloAdoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs. *MIS Quarterly*, 23(2), 183-213.
 25. Kiều, T. T. (2011). Các nhân tố ảnh hưởng đến sự hài lòng về chất lượng dịch vụ Internet Banking của khách hàng cá nhân. *Tạp chí Khoa học.*, 5(23), 16-29.
 26. Kim, Y., Park, Y., Choi, J., & Yeon, J. (2015). An Empirical Study on the Adoption of FinTech Service: Focused on Mobile Payment Services. *Advanced Science and Technology Letters*, 114(26), 136-140.
 27. Legris, P. I. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40(3), 191-204.
 28. Mallat, N., Rossi, M., Tuunainen, V., & Öörni, A. (2009). The Impact of Use Context on Mobile Services Acceptance: The Case of Mobile Ticketing. *Information & Management*, 46(3), 190-195.
 29. Moon, J. W. (2001). Extending the TAM for the World-Wide-Web context. *Information and Management*, 38, 217-230.
 30. Novak, J. (2010). Internal influence: Lifestyle and Attitude. Retrieved 5 15, 2018, from <http://www.marketingteacher.com/internal-influences-lifestyle-and-attitude/>
 31. Osborne, J. (2008). *Best practices in quantitative methods: 3 Best Practices in Interrater Reliability Three Common Approaches*. Thousand Oaks: SAGE Publications, Inc.
 32. Pavlou, P. L. (2007). Understanding and Mitigating Uncertainty in Online Exchange Relationships: A Principal-Agent Perspective. *MIS Quarterly*, 31, 105-136.
 33. Philippon, T. (2017). The FinTech Opportunity. *BIS Working Papers*, 665, 1-29.
 34. Pikkarainen, K. &. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research*, 14(3), 224-235.
 35. Prasad, R. A. (1998). A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology. *Information Systems Research*, 9(2), 204 - 215. doi:<https://doi.org/10.1287/isre.9.2.204>
 36. Rigopoulos, G. &. (2007). A TAM Framework to Evaluate Users' Perception towards Online Electronic Payments. *Journal of Internet Banking and Commerce*, 12(3), 2-6.
 37. Roboff, G. &. (1998). Privacy of financial information in cyberspace: banks addressing what consumers want. *Journal of Retail Banking Services*, 20(4), 51-56.
 38. Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). New York: Free Press.
 39. Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). The Free Press.
 40. Sathye. (1999). Adoption of Internet banking by Australian consumers: an empirical investigation. *International Journal of Bank Marketing*, 17(7), 324-334.
 41. Schiffman, L., & Kanuk, L. L. (1987). *Consumer behavior* (3rd ed.). New York: Prentice-Hall International Editions.
 42. Schueffel, P. (2016). Taming the Beast: A Scientific Definition of Fintech. *Taming the Beast: A Scientific Definition of Fintech*, 32-54.
 43. Shim, Y., & Shin, D. (2016). Analyzing China's Fintech Industry from the Perspective of Actor–Network Theory. *Telecommunications Policy*, 40(2-

- 3), 168-181.
doi:https://doi.org/10.1016/j.telpol.2015.11.005
44. Smith, A. A., Synowka, D. P., & Smith, A. D. (2014). E-commerce quality and adoptive elements of e-ticketing for entertainment and sporting events. *International Journal of Business Information Systems*, 15(4), 450-487.
45. Teo, T. S. (1999). Intrinsic and extrinsic motivation in Internet usage. *Omega*, 27(1), 25-37.
46. Tung, F. L. (2009). An extension of financial cost and TAM model with IDT for exploring users' behavioral intentions to use the CRM information system. *Social Behavior and Personality: An international journal*, 37, 621-626.
47. Tuyết, L. T. (2011). Nghiên cứu động cơ sử dụng dịch vụ Internet Banking của người tiêu dùng tại thành phố Đà Nẵng. *Tạp chí nghiên cứu khoa học Đại học Đông Á*, 4, 17-27.
48. Venkatesh, V. &. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186-204.
49. Venkatesh, V. M. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425-478.
50. Venkatesh, V. T. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36(1), 157-178.
51. Wu, J. H. (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information & Management*, 42(1), 719-729.
52. Wu, J., & Wang, S. (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information & Management*, 42(1), 719-729.
53. Xu, X. (2014). Understanding Users' Continued Use of Online Games: An Application of UTAUT2 in Social Network Games. *The Sixth International Conferences on Advances in Multimedia*, (pp. 58-65).
54. Yoo, S. J. (2012). The roles of intrinsic motivators and extrinsic motivators in promoting e-learning in the workplace: A case from South Korea. *Computers in Human Behavior*, 28, 942-950.