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Impacts of Perceived Security and Knowledge on Continuous Intention to Use Mobile Fintech Payment Services: An Empirical Study in Vietnam*

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Abstract

Stepping into the technological boom time, Vietnam has integrated into the trends of using Fintech applications as a new means of payment. This article evaluates the relationship between perceived security (including service security and platform security), knowledge, confirmation, perceived usefulness, satisfaction, attitude and lastly enterprise's images regarding the service and continuous intention to use Fintech services. The survey results of 352 Vietnamese customers using Fintech services, reliability test and extended post-acceptance model (EPAM) which is based on PAM and ECT models. From the survey, we further found out that perceived security (BSS) has no direct impact on continued intention to use, while perceived security (BSS) has positive impact on confirmation (CON), similarly, perceived usefulness (PU) and user's satisfaction (SES). Knowledge of the Mobile Fintech payment service (KNOW) has a positive impact on perceived security (BSS). Confirmation (CON) has a positive influence on perceived usefulness but in the meanwhile it has created a negative impact on user's satisfaction (SES). From the survey it can also tell that user's attitude (ATT) and enterprise image (IMG) both have a positive impact on continual intention to use Fintech services. From the research results, we also propose some recommendation to enhance the continual intention to use Fintech services in Vietnam.

Keywords: Fintech, Payment Service, EPAM, Technology, Service Security, Vietnam

JEL Classification Code: G41, O33, L84, L86

1. Introduction

New information and communication technologies (ICT) are dramatically transforming human life, economic systems, and society in general, into something very different from what we used to do and think about over the

last few decades. In particular, companies actively utilize ICT to provide their customers with enhanced service quality. Financial technology (Fintech) is used to describe an emerging trend in the financial industry - banking as well as other industries. Along with the development of Industry 4.0, more and more consumers are using Fintech products and services. Fintech has been attracting the attention of many technology experts, financiers and investors around the world. Total investment in financial technology in the first half of 2018 and reached \$ 31.7 billion with approximately 450 investments made successfully, nearly tripling in value over the same period in 2017.

The above figure has shown Fintech's strong and comprehensive development in recent years, making this field a part of the financial sector, promising to contribute to the changing face of the financial industry in the world. Vietnam is also a part of the development path of global Fintech, the country in recent years has also witnessed strong and extensive development of Fintech field. According to a survey by the market research firm McKinsey in Vietnam, 50% of respondents said that they are ready to use new

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financial technologies, especially the electronic payment system. Respondents said that in the next 10–15 years the traditional banking model will be replaced by the Fintech-banking model. Also according to McKinsey research, by 2025, traditional banks will have to face a reduction of 10–40% of profits because of the development of Fintech companies.

According to Solidiance's survey, Vietnam's Fintech market reached US \$ 4.4 billion in 2017 and is expected to reach US \$ 7.8 billion in 2025. Electronic transactions are also growing rapidly. In the second quarter of 2019, the growth rate of payment for banking services via smartphones has grown by 160%, higher than many other countries in the region. The number of Fintech companies participating in providing services in the Vietnam market has more than doubled from approximately 40 by the end of 2016 to nearly 100 companies at the present time. Out of nearly 100 companies operating in the field of Fintech in Vietnam, the majority of them operate as the payment intermediaries. So when thinking about Fintech, most people think that these companies basically function as payment intermediaries and provide e-wallets. But in fact, Fintech also covers a number of other segments such as peer-to-peer lending, block chain/ cryptocurrency, asset management, digital banking, point of sale (POS), and across many other different sectors.

Not only new Fintech startups have started, but many commercial banks are also gradually converting and operating digital banking systems based on modern technology platforms such as BIDV, Vietinbank, VPBank, TPBank, etc. customer service needs to be quick and smooth. Till today, Vietnam has 48 Fintech companies and 48% of companies are engaged in payment activities, providing customers and retailers with online payment services or digital payment solutions (2C2P, VTPay, OnePay, VTCPay, BankPlus, VinaPay, VNPay, Senpay, NganLuong, ZingPay, BaoKim, 123Pay.) (Nguyen, Doan, & Bui, 2020), (Nguyen, Dinh, & Nguyen, 2020). Initial adoption of Fintech payment services is a crucial first step toward the real Fintech sector because its eventual success is determined primarily by users' continued use.

Most of these financial services provide cost-effective platforms as an alternative to traditional financial services and enhance user experience through easy and convenient features of services. However, along with the opportunities for Fintech development in Vietnam, there are still many challenges. One of the biggest challenges for Fintech development in Vietnam and the whole world is the security issue for the users. One of the reasons for this is the fact that there is a lack of understanding of this new field of complex technology, which could lead to concerns about possible risks. From the above fact, understanding and identifying the interests of customers when using payment services applying financial technology and the factors affecting the ability to receive financial technology services in the bar. Customer's payment is essential for these financial institutions in the

process of developing and applying financial technologies in banking activities in general and in any particular payment. This study helps administrators understand what are the main factors affecting customers' receipt of financial technology services in Vietnam.

In fact, in Vietnam, there are not many research articles that emphasize the criteria when using Fintech payment applications (Nguyen, Doan, & Bui, 2020) (Nguyen, Dinh, & Nguyen, 2020) (Nguyen O. T., 2020). In the world, there have been many studies on factors influencing the decision to use Fintech applications (Lim, Kim, Hur, & Park, 2018) However, these studies are conducted in developed countries with the condition of facilities, the development of science and technology as well as a developed economy, which is very different from a country like Vietnam. Therefore, specific studies are needed for this extremely strong developing industry. For that reason, to contribute to Fintech enterprises in Vietnam, there is a need to have a more specific view on the factors affecting the decision to use Fintech services when planning development plans in both short and in the long run, which could in turn provide consumers with better services. This study aims to explore the impact of several key factors affecting the decision to use Fintech services in Vietnam.

2. Literature Review

The theory of expectation (ECT) is a vertical model developed in the field of consumer behavior (Anderson & Sullivan, 1993), (Oliver, 1981). In particular, the model reflects the difference between the two points before and after the purchase. In other words, ECT analyzes the relationship between pre-production (i.e. expectations in primary consumer products) and post-purchase (i.e., confirming, sensing, and intent to repurchase after purchase onions). Among the studies on financial services (eg online banking) using information technology, (Bhattacharjee, 2001) proposed PAM based on ECT model as a theoretical framework. PAM explains the process of continually accepting online banking services through the perception of satisfaction and the perceived usefulness.

As a matter of fact, the Technological Acceptance Model (TAM) has long been the core of study for many researchers to examine the factors affecting the continuous usage of non-cash payment, digital banking and other technological advances (Nguyen O. T., 2020). However, the limitation of these researches based on this model is that their main or even sole concern was the pre-acceptance of technology though there was not much of perceived knowledge or so called post acceptance in the use of online payment methods. Based on TAM, the Post Acceptance Model (PAM) has been drawn by Bhattacharjee as a theoretical framework and we would like to inherit that model into our findings for Vietnam situations.

PAM is presented as a post perceived usefulness and a sense of ease for continuous intention to use technological advancement in payment methods, and specifically in this research, the use of Fintech based payment methods. In other words, PAM explains the continuous acceptance process of online payment services through perception of satisfaction and ease in usage. Previous empirical research has shown that usefulness impacts end user consistently in both stages before and after acceptance but ease mostly affects the former. However, we hold the belief that the factors resulting from the post acceptance stage are not yet to be fully examined and their credibility are still being underestimated, hence, we would suggest that PAM is suitable for our research.

3. Research Methodology

3.1. Model and Research Hypothesis

Based on a total synthesization of previous researches on customers' expectation and acceptance of Technological services, we proposed EPAM model for further investigation on the relationships among knowledge, service security, platform security, acceptance, usefulness, satisfaction and customers' attitude, enterprise images and lastly on continuous intention to use payment service by Fintech of users in Vietnam as follow in Figure 1.

3.2. Research Hypothesis

According to (Lim, Kim, Hur, & Park, 2018) the level of knowledge on protection of personal information has influence on the compliance intention and compliance

behaviors of individuals. The more knowledge users have on their Fintech payment services the more reliable they are understood to be (Hur, Lim, Kim, & Park, 2017) perceived service security, platform security, network security, and device security as important variables in using IoT based banking services. Based on this argument. this research proposes a positive relationship between knowledge of Fintech and perceived security protection. The H1 hypothesis is as follows:

H1: *Users' knowledge of Fintech services is positively related to their perceived security of the services.*

Users' perception of security protection is a cognitive process that would affect emotional and behavioral intentions (Bhattacharjee, 2001); (Hur, Lim, Kim, & Park, 2017) The relationship among cognition, emotion, and behavioral intentions of the users of information technology services is continuously circulated, and thus, have impact on the continuous use of information technology services in term of attitudes change (Bhattacharjee, 2001). Thereby, perceived security is believed to have an impact on continuous intention to use the services rather than any cognitive factors. Therefore, this study proposes the following hypotheses.

H2a: *Users' perceived security protection is positively associated with their confirmation.*

H2b: *Users' perceived security protection is positively associated with perceived usefulness.*

H2c: *Users' perceived security protection is positively associated with their level of satisfaction.*

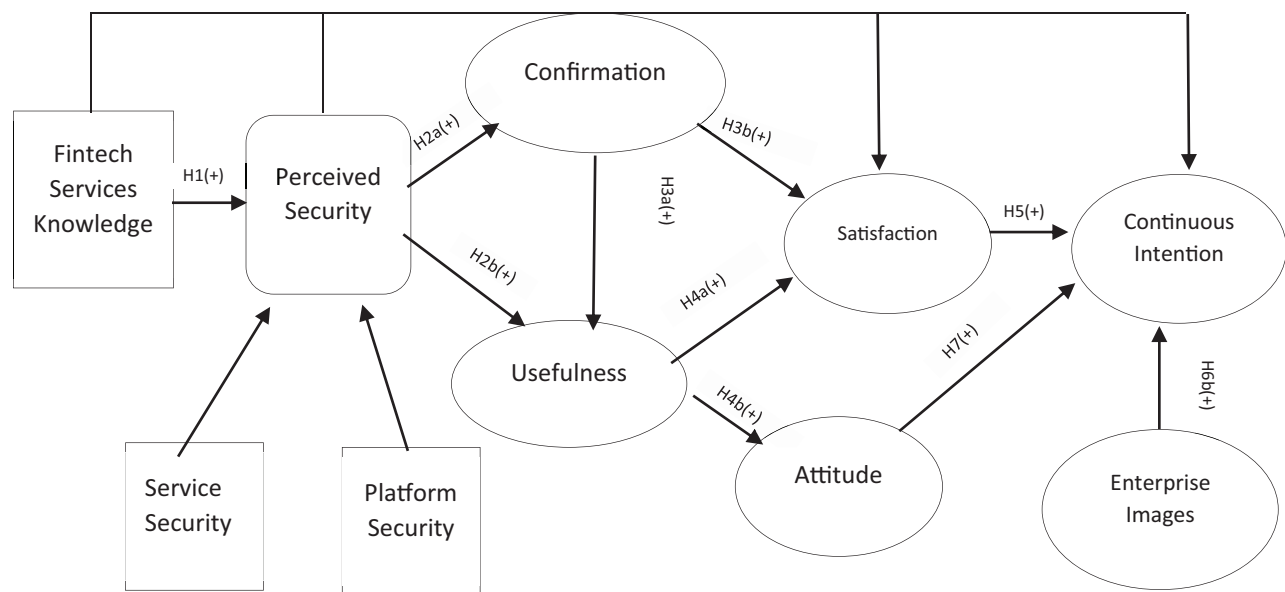


Figure 1: Research Model

H2d: Users' perceived security protection is positively associated with their continuous intention to use Fintech services.

A wide range of studies have already tested and validated the relationships among confirmation, usefulness, satisfaction, and continuous intention that have been tested and validated, e.g. (Bhattacharjee, 2001); (Kim D. J., An investigation of the effect of online consumer trust on expectation, satisfaction, and post-expectation, 2012), (Lee M. C., 2010) (Lim S. H., 2012). It has been proven in previous research that confirmation of users in technical advancements has a positive effect on perceived usefulness and user's satisfaction (Nguyen, Doan, & Bui, 2020). Therefore, we propose the following hypotheses.

H3a: Users' confirmation is positively associated with perceived usefulness.

H3b: Users' confirmation is positively associated with their continuous intention to use Fintech services.

H4a: Users' perceived usefulness is positively associated with their level of satisfaction.

H4b: User's perceived usefulness is positively associated with their attitude toward the service.

H5: User's satisfaction usefulness is positively associated with their continuous intention to use Fintech services.

In this research, an enterprise's image is defined as positive qualities of the reputation of the firm such as their prosperity, trustworthiness, and contribution to the society (eg: charity works, environmental awareness, ETC). An impressive enterprise image has great impact on users' positive attitude toward the service and their continuous intention to use the product and Fintech payment services is included. Hence the hypothesis is put forward:

H6a: Enterprise's image is positively associated with users' attitude toward the Fintech payment services.

H6b: Enterprise's image is positively associated with users' continuous intention to use Fintech services.

H7: Users' satisfaction image is positively associated with users' continuous intention to use Fintech services.

3.3. Research Design

Through reference to previous studies, we conducted a survey to build a questionnaire as well as ways to measure the factors in the model. Firstly, a plot was distributed to a small group of users who would later feedback on the intelligibility of the questionnaire. The research model consists of 5 concepts in the form of latent variables: confirmation, usefulness, satisfaction, attitude and continuous intention; and other variables such as Fintech service knowledge, perceived security, enterprise images (Specifically, see Appendix A).

3.4. Data collection

The designed questionnaire was officially delivered to customers who used and were using Fintech payment services. Form of direct or online coupons by convenience method combined with data collection based on snowball principle. The survey period is from March to April 2020. The result came back with 352 valid answer that are appropriate and reliable enough for multivariate analysis in the study (Hair Jr, Black, Babin, Anderson, & Tatham, 2006)).

4. Results

4.1. Descriptive Statistics

The 352 votes were good for studies using data analysis (Hair Jr, Black, Babin, Anderson, & Tatham, 2006). At the same time, among the 352 collected surveys, 56 (15.9%) of the survey respondents came from students with higher education, and only 3.4% came from high school students. This study was conducted with the subjects who have used Fintech payment services before, in which 50% of survey participants have usage level from 2–5 times a week, with less than 2 times a week is 33% (116 votes out of 352 votes) and only 17% of survey participants use Fintech payment services for more than 5 times a week.

The statistics describe the survey data with 116 men accounting for 33% and 236 accounting for 67%. In terms of degree level most customers are university-educated (287 people account for 80.7%), 56 people have acquired postgraduate education which account for 15.9% and the high school education accounted for 3.4% (12 people). The frequency of use over 5 times a week has the lowest proportion (accounted for 17% (60 people), followed by people who use it only for less than 2 times a week (116 people, accounted for 33%). People who use it 2–5 times a week have the highest number (176 people, accounted for 50%) (see Table 1).

Table 1: Descriptive Statistics

		Number	Percent %
Gender	Male	116	33
	Female	236	67
Education	College/University	284	80.7
	High school	12	3.4
	Post Graduated	56	15.9
Frequency of use	Under 2 times/week	116	33
	Over 5 times/week	60	17
	2–5 times/week	176	50
	Total	352	100

4.2. Evaluating the Scale Reliability and Validity

Two criteria to evaluate a factor that is reliable when measuring through observed variables are Cronbach’s Alpha coefficient greater than 0.6 and the item-total correlation is greater than 0.3. Observed variables with a total correlation coefficient of less than 0.3 will be excluded from the factors and considered as garbage variables. After elimination, this observed variable will not be included in the subsequent analysis.

The factor loading of items are greater than 0.5, so it is possible to see the model of convergence validity. The results of the general reliability analysis and the extracted variance show that the factors are the scales with load factor greater than 0.5, reaching to the convergence validity. The composite reliability of the factors above 0.7 and the Average Variance Extracted (AVE) are greater than 50%. This shows that the factor scales in the formal sample have achieved the necessary reliability (see Table 2).

Factor loading greater than 0.5 in each factor are considered to have convergence validity and the square

root of the variance greater than the correlation between research concepts are concepts with discriminant validity (see Table 3).

4.2. SEM Analysis

The initial analysis results showed that the factor loading of factors are greater than 0.5 and the explanatory variance are greater than 50%, indicating that all factors achieve the convergence value. After reviewing the convergence of each factor, the research conducted to assess the distinctiveness of the factors through AVA’s square root index and correlation coefficient between factors. The analysis results show that all factors achieve discriminant value when the square root of AVE is greater than the correlation coefficient with each factor (see Figure 2).

The results of SEM model show that Knowledge factor (KNOW) has a positive effect on Perceived security (BSS) which indicates that the Hypothesis H1 is accepted which means consumer awareness of security protection is a rational process and can affect intended emotions

Table 2: The Reliability Test

	Cronbach’s Alpha	Composite Reliability	Average Variance Extracted (AVE)
ATT	0.81	0.892	0.733
BSS	0.91	0.933	0.666
CONFIRM	0.77	0.869	0.688
CUI	0.83	0.903	0.756
IMG	0.89	0.913	0.678
KNOW	0.80	0.869	0.624
PU	0.87	0.907	0.661
SES	0.83	0.902	0.754

ATT: Attitude toward; BSS: Securities; CONFIRM: Confirmation; CUI: Intention to continue using; IMG: Images of Enterprises; KNOW: Knowledge; PU: Perceived usefulness; SES: Satisfaction.

Table 3: Discriminant Validity

	ATT	BSS	CONFIRM	CUI	IMG	KNOW	PU	SES
ATT	0.856							
BSS	0.581	0.816						
CONFIRM	0.577	0.625	0.830					
CUI	0.856	0.590	0.560	0.870				
IMG	0.711	0.748	0.651	0.718	0.823			
KNOW	0.707	0.535	0.524	0.728	0.608	0.790		
PU	0.781	0.635	0.682	0.751	0.740	0.600	0.813	
SES	0.806	0.732	0.645	0.805	0.767	0.693	0.793	0.868

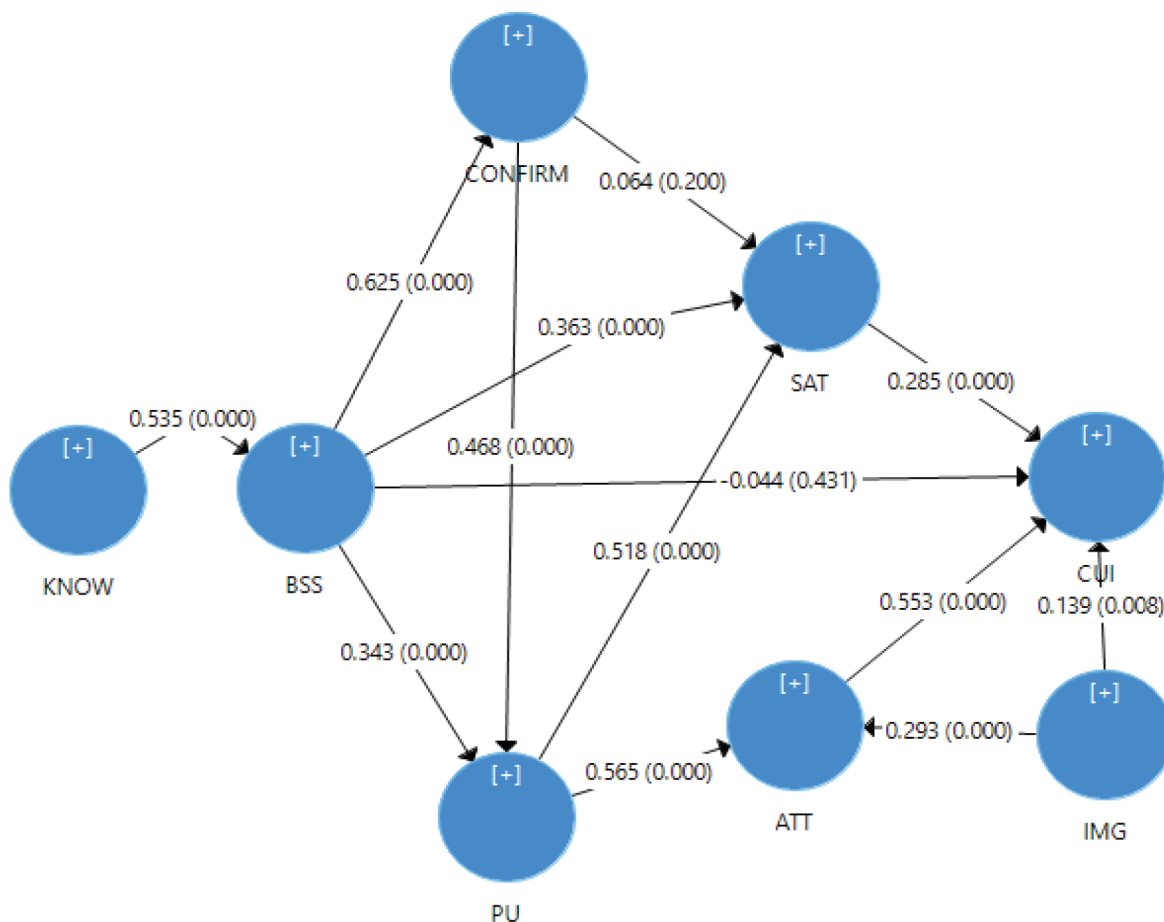


Figure 2: SEM Analysis Results

and behaviors (Bhattacharjee, 2001) (Hur, Lim, Kim, & Park, 2017). The relationship between the intellect, emotions and behavioral intent of users of information technology services is one that continuously coordinates and influences the intention to continue using information technology services. That is new in terms of attitude changes (Bhattacharjee, 2001). Alternatively, perceived security factors (BSS) has a positive impact on user’s confirmation (CON), Perceived usefulness (PU) and user’s satisfaction (SES) which show that Hypotheses H2a, H2b and H2c are accepted. These indicate that, the higher the level of security the higher the satisfaction of the users. Customers are well aware that the importance of information safety is the factor which reflects the usefulness of the service. Unlike our expectations, perceived security does not significantly influence the continual intention to use Fintech services which means hypothesis H2d is not supported. That perceived security does not have any direct impact on the continual intention to use Fintech services shows that the more attention customers pay on

information security the less they pay attention to continue using the service.

Confirmation (CON) has positive impact on Perceived usefulness (PU) which indicates that hypothesis H3a is accepted. Besides that, CON has no positive impacts on customers’ satisfaction as hypothesized, meaning hypothesis H3b is not supported. That is to say user confirmation has no effects on their satisfaction with Fintech payment service. SEM model also shows that Perceived usefulness has positive impacts on both user’s satisfaction (SES) and their attitude (ATT), this means hypotheses H4a and H4b are accepted. indicating that the more useful customers feel about the Fintech services, the more they think it is deserved and experienced and makes them feel more satisfied when using the services. From the research we can see that, User’s satisfaction (SES) has a positive impact on the continual intention to use Fintech services, hypothesis H5 is accepted. Indicating that, the more satisfaction the customers have the more they think about continuation to use the services.

SEM model also points out that the image of enterprises has a positive impact on the customer attitude (ATT) and the continual intention (CUI) to use Fintech services indicates that customers trust in images of the enterprise who are in charge of providing the Fintech services help to create good attitude towards services and brings thoughts on continuous use of the services, which means that hypothesis H6a and H6b are accepted. Last but not the least, customer's attitude has a positive impact on the continuous intentions to use Fintech services which means that hypothesis H7 is accepted. The results also shown the values which represent the explanatory power of the dependent constructs of the research model is at a high level ($= 0.774$) and shows that all factors can explain 77.4% of the change in CUI; also other dependent variables in the model can be well-explained with at the same level.

5. Conclusion

The research has shown that the consequential relationships among factors through a structured model and is proven that perceived security, perceived usefulness, knowledge of Fintech service, enterprise image, and attitude toward such services have a positive impact on the confirmation and continuous intention to use Fintech payment services by the users. Therefore, in order to increase the intention to use the service, Fintech enterprises should focus on enhancing the usefulness and security of the service as well as their image. A system that ensures safe financial transactions to be made without risk of losing money and owns a wide range of features that not only can be used with ease but is also potentially useful to users in many ways, is highly recommended. Moreover, the reputation of enterprise is also worth noting down with the fact that the more trustworthy, prosperous and socially concerned they are, the better is their image in the view of the public.

Besides, the users' perceived knowledge also has a positive impact on the confirmation and continuous intention to use. Hence, clear instruction and simple features design also need the attention of the firm to assist customers. To some extent, this would give a boost to customers' perceived security as well. Despite having achieved research purposes, there are some limitations regarding the scope of this research including the age group of the interviewees (85.2% is under 24) due to limited number of samples and potentially other factors that the authors might have not yet considered.

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Appendix 1: Questionnaire Table

Code	Items	Mark				
I	Perceived Security					
BSS1	Payment service security is guaranteed in the use of the Fintech service.	1	2	3	4	5
BSS2	When I use the Fintech service, the payment transaction process us secured.	1	2	3	4	5
BSS3	When I use the mobile Fintech service, the user authentication method is secure.	1	2	3	4	5
BSS4	In using the mobile Fintech service, the financial transaction authentication method is safe.	1	2	3	4	5
BPS1	In using the mobile Fintech service, the platform is secure.	1	2	3	4	5
BPS2	When I use the mobile Fintech service, the operating system is safe.	1	2	3	4	5
BPS3	As I use the mobile Fintech service, the platform is being maintained and repaired periodically.	1	2	3	4	5
II	Perceived Usefulness					
PU1	The mobile Fintech service provide real-life convenience in managing personal finances.	1	2	3	4	5
PU2	The mobile Fintech service are useful in real-life management of personal finances.	1	2	3	4	5
PU3	In general, the mobile Fintech service provide convenience in various personal financial fields.	1	2	3	4	5
PU4	In general, the mobile Fintech service are fast in managing personal finances.	1	2	3	4	5
PU5	In general, the mobile Fintech service are accurate in managing personal finances.	1	2	3	4	5
IV	Confirmation	Mark				
CON1	My experience with the mobile Fintech service was better than what I expected.	1	2	3	4	5
CON2	The service level provided by the mobile Fintech service was better than what I expected.	1	2	3	4	5
CON3	Overall, most of my expectations about the mobile Fintech service were confirmed.	1	2	3	4	5
V	Knowledge of Fintech Services	Mark				
KNOW1	I have sufficient knowledge to use the mobile Fintech service.	1	2	3	4	5
KNOW2	I have sufficient knowledge to handle any problems that may arise during the use of the mobile Fintech service.	1	2	3	4	5
KNOW3	I have sufficient knowledge to process a mobile Fintech transaction.	1	2	3	4	5
KNOW4	I am well informed about how to deal with problems caused by using the mobile Fintech service.	1	2	3	4	5
VI	Attitude toward Fintech Services					
ATT1	I feel that using Fintech service is a smart choice.	1	2	3	4	5
ATT2	I feel that using Fintech service is an interesting experience.	1	2	3	4	5
ATT3	I feel that the use of Fintech service will be an inevitable trend.	1	2	3	4	5
VII	Satisfaction					
SES1	Overall, I am satisfied with the mobile Fintech service.	1	2	3	4	5
SES2	Using the mobile Fintech service gives me satisfaction in financial transactions.	1	2	3	4	5
SES3	Using the mobile Fintech service makes financial transactions more convenient.	1	2	3	4	5

Appendix 1: (Continued)

Code	Items	Mark				
VIII	Enterprise Image					
IMG1	The Fintech company that I trusted to use owns great reputation in the field.	1	2	3	4	5
IMG2	The Fintech company that I trusted to use its payment service is familiar with most people.	1	2	3	4	5
IMG3	The Fintech company that I trusted to use its payment service is successful in its industry.	1	2	3	4	5
IMG4	The Fintech company that I trusted to use its payment service has many activities to contribute to the society.	1	2	3	4	5
IMG5	The Fintech company that I trusted to use its payment service always shows care and honesty to its customers.	1	2	3	4	5
IMG6	The Fintech company that I trusted to use its payment service always shows their integrity when providing the services.	1	2	3	4	5
IX	Continuous Intention to Use					
CUI1	I will continuously use the mobile Fintech service.	1	2	3	4	5
CUI2	My intention is to continue use the mobile Fintech service rather than find any alternative means (e.g., traditional payment services).	1	2	3	4	5
CUI3	I would like to use the mobile Fintech service in the near future.	1	2	3	4	5