

Perceived Risk and Intention to Use Credit Cards: A Case Study in Vietnam

Nam Hoang TRINH¹, Ha Hong TRAN², Quan Duc Hoang VUONG³

Received: December 20, 2020 Revised: March 07, 2021 Accepted: March 15, 2021

Abstract

This study aims to develop a theoretical model in order to determine factors affecting consumer intention to use credit cards by combining Theory of perceived risk and Technology acceptance model. Despite of perspective of consequences in prior studies on related research fields, this study focuses on the sources of perceived risk, including transaction, payment and credit risks, which are proposed and measured in a preliminary research. A measurement model and a structural model with the presence of perceived risk in sources are tested in a formal research with data collected from 538 bank customers. An analysis results show that payment risk, usefulness, transaction risk, ease of use, and credit risk influence significantly Vietnamese consumers' intention to use credit cards in decreasing order of influence. These factors account for 64.6% of the variation in intended use. All three dimensions of perceived risk have a negative effect on the intention to use, with the total impact greater than the level of influence of the other two factors of usefulness and ease of use. These findings can be beneficial to banks in enacting policies to attract more consumers and to allocate resources for improving their credit card business.

Keywords: Credit Card, Perceived Risk, Behavioral Intention, Vietnam

JEL Classification Code: D12, D14, E42, G21

1. Introduction

In recent years, Vietnamese credit card market has become vibrant with the presence of international card brands such as VISA, Master, JCB, CUP. Banks devote a considerable part of budget to invest and develop card products and services, in which credit cards are a special financial instrument with two principal functions of electronic payment and consumer loan (Kaynak & Harcar, 2001). Customers can pay with credit cards at the point of sales, on online payment portals or mobile payment applications. The most important difference between credit cards and other e-payment instruments is the

availability of consumer loans. Whenever cardholder pays bills with credit card, the bank disburses him exactly with the amount showed on the bill, and then he must return this amount fully and timely. Meanwhile, with other e-payment methods, customers need to deposit money into the account first and then use it for billing within the account's balance (Seetharaman, Patwa, Niranjana, & Kavuri, 2016).

The report of the State Bank of Vietnam (2020) shows that banks have issued accumulated about 4.9 million credit cards out of 103 million bank cards. With approximately 57.36 million commuters, the percentage of credit card ownership in Vietnam is about 0.08 cards / person. This rate is lower than that of Southeast Asia (0.22 cards / person) and the world (0.81 cards / person). In addition, the Global Financial Index Report (World Bank, 2020) shows that the credit card penetration rate in Vietnam is 4.7%, so about 2.65 million workers own credit cards, a relatively modest number compared to 9 million urban households (General Statistics Office of Vietnam, 2020), 46 million bank users (State Bank of Vietnam, 2020) or 15.8 million people in need of consumer loans with annual consumer credit growth of up to 20%.

With credit cards becoming increasingly important and popular in many countries, the number of studies published

¹First Author and Corresponding Author. Lecturer, Faculty of Management Information System, Banking University Ho Chi Minh City, Vietnam [Postal Address: 36 Ton That Dam street, District 1, Ho Chi Minh City, 700000, Vietnam] Email: namth@buh.edu.vn

²Lecturer, Faculty of Banking, Banking University Ho Chi Minh City, Vietnam. Email: hath@buh.edu.vn

³Associate Professor, Ho Chi Minh City Institute for Development Studies, Vietnam. Email: quanvuong.aca@gmail.com

© Copyright: The Author(s)

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

on credit card adoption has increased in recent years. These studies propose factors influencing the intended use of credit cards in two approaches. Some studies have introduced research concepts and their relationships based on previous studies (Cheu & Loke, 2010). The remaining studies applied theoretical consumer behavior frameworks (Amin, 2013; Nguyen & Cassidy, 2018; Tan, Ooi, Chong, & Hew, 2014; Vuong & Trinh, 2017; Wang & Hsu, 2016). These studies both focused on the payment function of credit cards. Function of consumer loan, the most important difference between credit cards compared to other types of electronic payment (Kaynak & Harcar, 2001) was not mentioned. This defect can reduce consumers' ability to express or do not reflect their perceptions on credit cards.

The results of a literature review show the consistent effects of perceived usefulness, perceived ease of use on intended use of credit cards, which are supposed by the famous Technology acceptance model TAM (Davis, Bagozzi, & Warshaw, 1989). Consumers are decisive, so they intend to perform a behavior when they appreciate the performance achieved from that behavior (Nguyen & Cassidy, 2018; Tseng, 2016; Vuong & Trinh, 2017), and when they find it is easy (Jamshidi & Hussin, 2016; Wang & Hsu, 2016). However, the aforementioned studies do not reach a consensus on the role of perceived risk, which has been theoretically and experimentally confirmed in prior studies (Pelaez, Chen, & Chen, 2019). Some studies show that perceived risk has a negative effect on intent to use (Amin, 2013; Trinh & Vuong, 2019), some others reject a meaningful relationship between these concepts (Tan et al., 2014; Tseng, 2016).

Almost prior studies on credit cards measured perceived risk from the perspective of potential consequences (Tan et al., 2014; Trinh & Vuong, 2019; Tseng, 2016). This approach shows how consumers are anxious about potential harms related to behavior, but overcoming that anxiety to commit the behavior requires understanding about a source of losses. However, measuring perceived risk from the source of losses only occurs in few studies related to e-commerce (Herrero & Martin, 2012; Lim, 2003; Park, Lee, & Ahn, 2004). Based on the characteristics and usage of credit cards, potential losses can arise from the form of transaction and two functions of bill payment and consumer credit (Foscht, Maloles, Swoboda, & Chia, 2010; Turban et al., 2018).

Perceived risk from the source of losses with the presence of transaction, payment, and credit risks is a fresh issue in the research framework for credit card industry. To achieve this goal, the study begins with a brief review of consumer behavior. As a result, the study develops a theoretical model and testable hypotheses, which are followed by the research methodology and data collected. The findings are described and discussed before making some conclusions and future research directions.

2. Literature Review

Researchers have developed several frameworks over the years to explain consumer intended and actual behavior. Prominent among them, theory of perceived risk TPR (Bauer, 1960) focused on how consumers worry about potential losses and its negative effect on their intention in a specific buying's situation. However, consumers are not only risk averse but also reasoned; they intend to do something when they perceive this behavior is useful, easy to do (Mortenson & Vidgen, 2016).

Credit cards, a product of technology, are used on e-devices with two basic functions: payment and credit (Foscht et al., 2010). Credit cardholder buys first, pays later based on bank commitment (Amin, 2007). Issuing bank will pay for billers on behalf of cardholder, who pay back fully and timely (Foscht et al., 2010). In modern commerce, credit cards become increasingly important and popular (Turban et al., 2018). Studies on credit cards are conducted and published in reputable scientific journals, in which perceived usefulness and perceived ease of use from TAM, the most referenced theoretical framework in technology adoption studies, are frequently used to predict consumer intended use of credit cards. For example, Amin (2007) developed the changed version of TAM, in which perceived usefulness, perceived ease of use, perceived credibility, and the amount of information on mobile credit card are important determinants to predict Malaysian bank customers' intentions to use mobile credit card. Tan et al. (2014) suggested perceived usefulness and perceived ease of use from the parsimonious TAM have positive effects on the adoption of NFC-enabled mobile credit card, an innovation in contactless payment for the future generation. Jamshidi and Hussin (2016) advocated that perceived religiosity increase the TAM predictive power to clarify intention to use, while perceived usefulness, perceived ease of use explained low level of the variance regarding the intended use. Vuong and Trinh (2017) found that perceived usefulness, perceived ease of use, and subjective norm have a positive impact on credit card's adoption among Vietnamese consumers. Nguyen and Cassidy (2018) investigated the key elements that influence an individual's intention of adopting credit cards in the transitional economy Vietnam by modifying the parsimonious TAM; the analysis found that perceived usefulness, perceived ease of use, subjective norm, perceived self-efficacy, and anxiety significantly affect the intended use of credit cards. These aforementioned studies are similar in that they both focus on the payment function of credit cards. Function of consumer loan, the most important difference between credit cards compared to other types of electronic payment is not mentioned (Kaynak & Harcar, 2001).

Bauer (1960) introduced the concept of perceived risk as a compensation of the uncertainty with the possibility of loss

related to certain behavior and the importance attributed to that loss. In consumer perspective, observed risk refers primarily to the customers' subjective expectations for incident losses (Featherman & Pavlou, 2003). Once consumers perceive uncertainties about a particular behavior, they will change their thoughts about that behavior, which is a decisive factor in whether they do it actually. Cox and Rich (1964) supposed that perceived risk is not a single component, it is an overall perception about consumer's uncertainty of a specific buying's situation. Roselius (1971) measured perceived risk as a combination of financial, performance, physical, social, psychological and time risks. By introducing residential Internet in early 1990s, privacy and security risks appeared as two new components of perceived risk (Featherman & Pavlou, 2003).

The aforementioned dimensions of perceived risk are negative consequences of buying and using products or services. The question is what can businesses do in response to those perceptions. Lim (2003) believes that researchers need to examine risk perceptions from a fresh perspective, in which the source of perceived risk is helpful for businesses in using resources in right places. Lim (2003) proposed technology, vendor, consumer, and product risks based on nine types of perceived risk from the consequences of behavior. Similarly, Park et al. (2004) found that consumers cannot see and hold products/services directly on the e-market, so they may feel anxious or uncertain when dealing with online suppliers. Consumers evaluate carefully the online supplier before performing transactions and thus the supplier's characteristics play an important role in facilitating the transaction (Featherman & Pavlou, 2003). As the result, Park et al. (2004) proposed two types of risk perceived from the sources of losses, including perceived product/service risk and perceived risk of online transactions.

Many empirical studies have proven that consumer perceived risk strongly effects on the intended use of e-services, including e-commerce (Tandon, Kiran, & Sah, 2018), e-payment (Cabanillas, Leiva, & Fernandez, 2018) and e-banking (Mutahar, Daud, Ramayah, Isaac, & Aldholay, 2018), which are closely related to credit card (Turban et al., 2018). However, only few studies mentioned about perceived risk as a determinant of consumer's intention to use credit cards; even their findings are inconsistent. Tan et al. (2014); Tseng (2016) found no evidence of the relationship between consumers' perceived risk and their adoption of credit cards. Meanwhile, Amin (2013) and Trinh and Vuong (2019) demonstrated that perception of losses affects negatively individual's attitude and then affects his intended use of a credit card. These studies measured perceived risk based solely on the consequences of paying with a credit card.

In summary, the literature review of perceived risk for electronic products and services shows that this concept and its dimensions are determined based on the consequences of

buying and using them. This perspective allows to express individual's anxiety toward different losses relevant to behavior, but how they overcome that perception to engage that behavior requires their understanding about the source of damages. Based on the characteristics and usage of credit cards, potential losses can arise from the form of transaction and two functions of bill payment and consumer credit. An approach of perceived risk in sources of losses is a fresh issue in the research framework for credit card industry in Vietnam and in the world.

3. Research Model Development

The literature review on credit card adoption shows that two cognitive states of perceived usefulness, perceived ease of use have the most influence on intention to use credit cards. Although not shown much in the aforementioned studies, the perceived risk is the greatest inhibitor of consumers' perceptions of usefulness, ease of use and their intended use of e-services (Hansen, Saridakis, & Benson, 2018; Phan, Nguyen, & Bui, 2019; Tandon et al., 2018). The relationships between perceived risk and its consequences are shown in Figure 1.

Perceived usefulness (PUS) is one of the most important factors in TAM and has been comprehensively studied as a major factor in the consumer's decision to adopt e-services, including e-shopping (Hansen et al., 2018; Rattanaburi & Vongurai, 2020), e-payments (Cabanillas et al., 2018; Phan et al., 2019), e-banking (Mutahar et al., 2018). In credit cards, perceived usefulness is an indicator of individuals' confidence in using credit cards will improve the efficiency of consumption payments. Experimental evidences show the effect of perceived usefulness on consumers' intended use of credit cards (Nguyen & Cassidy, 2018; Tan et al., 2014).

Perceived ease of use (PES) is another important factor in TAM and is an important prerequisite for consumers' intention to use e-services, including e-shopping (Hansen et al., 2018; Rattanaburi & Vongurai, 2020), e-payment (Cabanillas et al., 2018; Phan et al., 2019), e-banking (Mutahar et al., 2018). Based on TAM, this study defines ease of use as an indicator of consumer confidence in using

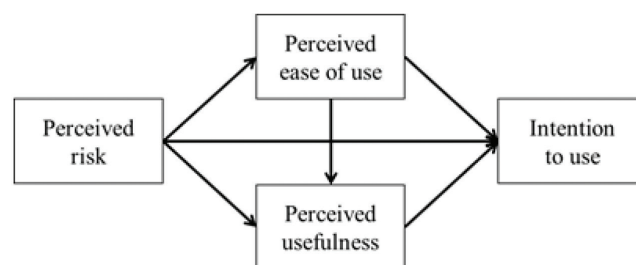


Figure 1: Theoretical Model

credit cards easily. The empirical evidences show that when consumers feel that paying with credit card is simple and easy, they appreciate the effectiveness of credit card payments (Jamshidi & Hussin, 2016). Perceived ease of use has also a positive influence on consumers' intention to use credit cards (Nguyen & Cassidy, 2018).

Perceived risk (PR) represents consumers' subjective expectations for the losses that can occur when performing specific behaviors (Bauer, 1960). Featherman and Pavlou (2003) also argued that perceptions of uncertainty can cause consumers to change their mindset about adopting new technology. Credit card is a kind of technology product, which meets the consumer loan needs of cardholder and debt arises only when the card is used on e-devices to pay bills or advance cash (Kaynak & Harcar, 2001). Therefore, this study defines perceived risk of credit cards as the consumer's assessment of the potential loss of using it in consumption payments.

Being the creator of perceived risk, but Bauer (1960) did not provide any measurement for this concept. Follow-up studies focused on the consequences of performing the behavior. The most common types of potential losses are mentioned in studies on perceived risk are performance, financial, psychological, social, time, security, and private (Pelaez et al., 2019). However, Lim (2003) argued that identifying the source of risk is important for firms because they can focus their resources to release consumers from negative perceptions and then encourage them to adopt behaviors. Therefore, this study examines perceived risk in two dimensions, including product risk and technology risk with some adjustments to credit cards. This study eliminates the supplier risk because an individual selects a credit card issuer and the card issuer itself provides the payment service or verifies payment intermediaries on suitable technology platforms. Park et al. (2004) supposed this elimination when providing two dimensions of perceived risk on e-commerce: product/service and online transaction. Meanwhile, credit cards facilitate and encourage customers to purchase, so they may fall into debt and are more likely to be insolvent (Kaynak & Harcar, 2001). Thus, the study introduce credit risk as the third dimension of perceived risk on credit cards. These dimensions of perceived risk are described below:

Credit cards provide the ability to pay bills from a credit source under agreements between related stakeholders. In these agreements, consumers must share their personal and financial information. The bank as a credit card issuer will digitize and store it in the credit card management system along with the transaction records, which is known as a customer profile. Although credit cards are issued by the buyer's bank, their transactions require the participation of many stakeholders, including the merchant's bank, the payment service provider, the bank card switching organization (Turban et al., 2018). A transaction, once started,

must be ended under the specified step-by-step procedure, in which transactional data is exchanged transparently between computer systems. Although computer systems are always available 24/7, downtime because of technical problems or maintenance or upgrades is inevitable. These systems are connected to the global network, so they can become targets of technology criminals to break transactions or steal customer data. Faced with problems related to the e-context, consumers decide whether to use it. Inheriting the results of Park et al. (2004), this study proposes perceived transaction risk (PTR) as a dimension of perceived risk on credit cards; it represents the level of consumer assessment about the potential losses caused by paying bills via e-devices.

Banks issue credit cards under consumer lending process (Foscht et al., 2010). Consumers contact the bank and register for issuance and use of credit cards. The bank approves the application documents, release, and hand over the credit card to the customer with a suitable credit limit. From there, the buyer can take out a bank loan to pay bills with a credit card; the cryptocurrency is transferred from the buyer's account to the seller's account (Turban et al., 2018). This payment is successful when the seller's account receives the exact amount transferred from the buyer's account. However, paying bills by credit card is not always easy, convenient, fast and supported by people around. Derived from the description of Park et al. (2004) for perceived risk of products / services purchased online, this study suggests perceived payment risk (PPR) is a dimension of perceived risk; it represents the consumer's assessment of the potential losses related to bill payments.

With credit cards, buyers can pay bills that are 3 to 5 times more valuable than their regular income. Such credit limit may be low comparing to the needs of some individuals, but can also be difficult for compulsive shoppers. When a payment occurs, the credit cardholder's account recognizes a corresponding debt. These debts accumulate in each reporting period and must be repaid on time to the bank (Foscht et al., 2010). The interest exemption is only applied in case that debtor pays off accumulated debt on time; conversely, it is calculated right at the time of execution for all transactions within the reporting period. Regardless of the reason, the credit card holder, who pays late or does not meet the minimum amount, is reported as overdue debt (Kaynak & Harcar, 2001). When an individual has many bank loans, only one of them is recognized as overdue, it automatically marks all remaining loans as overdue. Then, banks start debt collection and all credit contracts, that are under review or disbursement, are delayed or cancelled. Therefore, this study introduces perceived credit risk (PCR) as a fresh dimension of perceived credit, which represents how an individual worries about the potential losses when taking consumer loans with a credit card.

Perceived risk, a combination of uncertainty and danger, is a barrier in assessing the effectiveness of credit card payments

relative to other forms of payment (Featherman & Pavlou, 2003). With the feature of using on e-devices only, consumers are confused and worried about the insecurity of credit cards (Featherman & Pavlou, 2003; Park et al., 2004). Concerns about security breaches, loss of privacy and misuse of personal information outweigh the benefits of credit cards for consumers (Trinh & Vuong, 2019) and make them feel they need more effort to use them (Hansen et al., 2018; Mutahar et al., 2018). As a result, consumers may refuse to use credit cards (Nguyen & Cassidy, 2018; Trinh & Vuong, 2019). This view has received the support of many scholars in studies of perceived risk and intent to use e-commerce (Rattanaburi & Vongurai, 2020; Tandon et al., 2018), e-payments (Cabanillas et al., 2018) and e-banking (Mutahar et al., 2018).

Hence, this study examines credit cards in two functions of bill payment and consumer credit to investigate the relationships between three components of risk (transaction, payment, credit), perceived usefulness, perceived ease of use and intention to use of credit cards. The investigation is based on the following hypotheses:

H1: Perceived usefulness has positive effect on intention to use.

H2: Perceived ease of use has positive effect on perceived usefulness.

H3: Perceived ease of use has positive effect on intention to use.

H4: Perceived transaction risk has negative effects on perceived usefulness.

H5: Perceived transaction risk has negative effects on perceived ease of use.

H6: Perceived transaction risk has negative effects on intention to use.

H7: Perceived payment risk has negative effects on perceived usefulness.

H8: Perceived payment risk has negative effects on perceived ease of use.

H9: Perceived payment risk has negative effects on intention to use.

H10: Perceived credit risk has negative effects on perceived usefulness.

H11: Perceived credit risk has negative effects on perceived ease of use.

H12: Perceived credit risk has negative effects on intention to use.

4. Methodology

The focus of this study is to test the proposed model and research hypotheses (Figure 2). However, the sources of perceived risk on intention to use is a fresh approach in credit card industry. Thus, it is necessary to combine preliminary research with formal research. In the preliminary

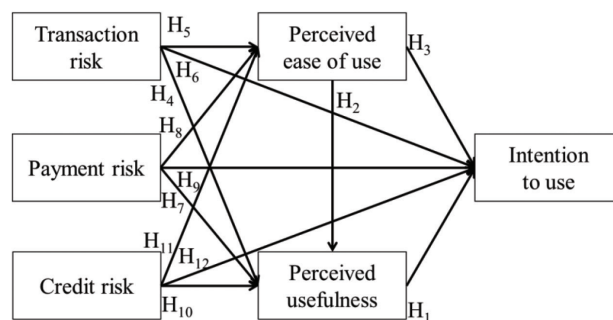


Figure 2: Proposed Research Model

research, two focus groups discuss the research concepts and their measurements, which are inherited from prior studies (Nguyen & Cassidy, 2018; Park et al., 2004; Seetharama et al., 2016; Tan et al., 2014) with some adjustments. The participants of the discussions are 5 bankers and 10 experienced credit card holders. Their recommendation is a measurement of 50 observed variables for 6 research, which is assessed in a pilot test with 224 bank users. The results showed that 35 observed variables are satisfactory and can be used in the formal research.

The formal research is a quantitative research using data collected from personal questionnaires, which are designed based on the aforementioned measurement of 35 observed variables in a five-point Likert multivariable scale (1-strongly disagree and 5-strongly agree). The online survey was conducted with the participation of 734 bank customers from a convenient sampling method. Only 538 responses are valid and usable, yielding a valid response rate of 73.3 percent among volunteered participants. With 35 observed variables, the required sample size is over 175 (Hair, Black, Babin, Anderson, & Tatham, 2014). The data from 538 respondents are therefore compatible with this requirement. Table 1 shows the descriptive statistics of respondents.

Based on the data collected, Cronbach's Alpha analysis is conducted to verify reliability of observed variables and their contribution to latent constructs in the proposed model (Hair et al., 2014). Reliable variables are appropriate for exploratory factor analysis EFA, which is one of the best statistical procedures for investigating underlying relationships between observed variables. Hair et al. (2014) stated that EFA will help to identify the minimum number of factors, which are available for Confirmatory factor analysis CFA. This famous statistical procedure is used to determinant the relationship between measured variables when researchers have some background knowledge of the underlying structure of these variables. Investigating the link between constructs and their measured variables is CFA's aim, so CFA is called as a measurement model within the framework of Structural Equation Model SEM.

Table 1: Descriptive Statistics

Variable	Frequency	Percent	Variable	Frequency	Percent
Gender			Marital status		
Female	275	51.1	Single	201	37.4
Male	263	48.9	Married	337	62.6
Age			Education		
Under 25	24	4.5	High school	0	0
From 25 to 35	262	48.7	College	140	26
From 35 to 45	185	34.4	University	233	43.3
From 45 to 55	55	10.2	Post-graduated	165	30.7
Above 55	12	2.2	Others	0	0
Income (USD)			Occupation		
Under 500	54	21.9	Industries	118	21.9
500–900	117	47.4	Trading services	145	27.0
900–1,600	52	21.1	Financial services	119	22.1
1,600–2,600	24	9.7	Public services	138	25.7
Above 2,600	0	0	Others	18	3.3

Based on prior studies, research assumptions are proposed about complex, flexible relationship between constructs extracted from observed variables. These hypotheses are examined statistically by SEM analysis (Hair et al., 2014).

5. Results

5.1. Cronbach's Alpha Analysis

The internal consistency reliability of the items is determined by Cronbach's alpha analysis. The results show that the scale of 6 concepts with 35 observed variables is reliable when the reliability coefficients are greater than 0.6 and the values of corrected item-total correlation are greater than 0.3 for almost observed variables, excepted PCR5 from perceived credit risk. This variable should be removed from the study (Hair et al., 2014). The second Cronbach's alpha analysis is conducted for 5-item perceived credit risk, in which reliability coefficient exceeds 0.6 and all corrected item-total correlation values are greater than 0.3. Therefore, 34 remain observed variables are eligible to factor analyses (Hair et al., 2014). Table 2 presents the summarized Cronbach's alpha analysis.

5.2. Factor Analysis

The first EFA extracts 5 factors from 30 observed variables; almost loading factors are greater than 0.5, excepted PUS3, PUS6, PES4, PPR4, PPR5, PCR3, PTR1 and PTR4. These variables should be removed from the study. The second

EFA is conducted on 22 remain observed variables, which extracts 5 factors with total extracted variance of variables is 67.485%, the KMO coefficient is 0.847 ($p = 0.000$), and all loading factors are greater than 0.5. These results show that the EFA of the independent components is appropriate (Hair et al., 2014). Observed variables in intention to use (IU) have high loading coefficients (≥ 0.795) and explain well its data variation ($\geq 82\%$). Therefore, the measurements were acceptable for CFA (Hair et al., 2014).

Next, the CFA is conducted for the proposed model with 6 factors and 26 observed variables to examine the model-data fit. The values of Chi-square/df = 1.719, GFI = 0.935, CFI = 0.978, TLI = 0.974 and RMSEA = 0.037 show that the suggested model is appropriate (Hair et al., 2014). Next, the validity of convergence is achievable because all factor loadings are greater than 0.5 (Table 2) and significant t-statistics (Hair et al., 2014). The average variance extracted (AVE) values of these constructs are greater than both 0.5 and squares of their correlation coefficients, so each construct is distinct and discriminant validity is acceptable (Hair et al., 2014). The composite reliability (CR) values of all latent constructs are greater than 0.6 (Hair et al., 2014). Therefore, CFA extracts 26 observed variables into 6 constructs, which are model-data fit, discriminant validity, uni-dimensionality, convergence validity and internal consistency reliability.

5.3. Structural Equation Modeling

The SEM is conducted to test the proposed research model and its research hypotheses. Figure 3 shows the whole SEM

Table 2: Reliability and Factor Analysis

Latent Constructs		Correlated Item-Total	Efa Loading Coefficients	Cfa Loading Coefficients
Intention to use credit card IU (Tan et al., 2014) Cronbach's $\alpha = 0.888$, Eigenvalues = 2.677, AVE = 0.669, C.R. = 0.89				
IU1	Will think about using credit cards	0.749	0.810	0.803
IU2	May use credit cards in near future	0.736	0.792	0.786
IU3	Intend to use your credit card as soon as the opportunity	0.803	0.873	0.869
IU4	Willing to use credit cards in the near future	0.739	0.795	0.812
Perceived usefulness PUS (Nguyen & Cassidy, 2018) Cronbach's $\alpha = 0.836$, Eigenvalues = 3.144, AVE = 0.626, C.R. = 0.893				
PUS1	Purchase without carrying cash	0.686	0.798	0.807
PUS2	Buy first and repay later	0.651	0.717	0.720
PUS3	Access to cash easily if needed	0.397		
PUS4	Installment purchases in free of interest	0.763	0.888	0.873
PUS5	Free of interest for up to 45 days	0.700	0.717	0.734
PUS6	Buy more even without paying off the previous purchase	0.355		
PUS7	Flexibly borrow and repay	0.752	0.826	0.812
Perceived ease of use PES (Nguyen & Cassidy, 2018) Cronbach's $\alpha = 0.853$, Eigenvalues = 4.675, AVE = 0.704, C.R. = 0.922				
PES1	Learn to use easily	0.719	0.785	0.800
PES2	Use credit cards easily	0.802	0.860	0.870
PES3	Easily find stores that accept credit cards	0.770	0.867	0.861
PES4	Do things at the same time, including using a credit card	0.367		
PES5	Use a credit card everywhere and every time	0.731	0.816	0.811
PES6	Use a credit card on many different devices	0.761	0.866	0.851
Perceived transaction risk PTR (Park et al., 2004) Cronbach's $\alpha = 0.744$, Eigenvalues = 1.979, AVE = 0.615, C.R. = 0.864				
PTR1	Loss money due to erroneous entry	0.345		
PTR2	Loss personal information	0.721	0.826	0.799
PTR3	Be bothered by unknown people	0.663	0.778	0.779
PTR4	Be stressful due to loss in online payment	0.310		
PTR5	Loss security when transmitting financial data	0.624	0.793	0.797
PTR6	Be attacked by cybercrimes	0.603	0.738	0.760
Perceived payment risk PPR (Park et al., 2004) Cronbach's $\alpha = 0.817$, Eigenvalues = 2.132, AVE = 0.699, C.R. = 0.903				
PPR1	Loss much money to use credit card	0.703	0.785	0.804
PPR2	Cannot pay with credit card	0.747	0.822	0.820
PPR3	Be anxious if the payment can't be transferred timely	0.764	0.853	0.849
PPR4	Be underrated by family and friends	0.416		
PPR5	Get laughed at for mistakes or cheats	0.411		
PPR6	Loss much time to troubleshoot and resolve complaints	0.731	0.882	0.869
Perceived credit risk PCR (new construct) Cronbach's $\alpha = 0.815$, Eigenvalues = 2.917, AVE = 0.711, C.R. = 0.907				
PCR1	Pay high interest on credit card debt	0.813	0.981	0.995
PCR2	Pay interest on fraudulent transactions	0.763	0.808	0.791
PCR3	Be dissatisfied because of low credit limit	0.344		
PCR4	Cannot pay debt fully and on time	0.656	0.760	0.773
PCR5	Loss control of spending			
PCR6	Be despised for debt and inability to repay	0.678	0.810	0.793

for the proposed model. The values of Chi-square/df = 1.719, GFI = 0.935, CFI = 0.978, TLI = 0.974 and RMSEA = 0.037 show that the proposed model is appropriate for data collected from the market (Hair et al., 2014). Almost relationships in the model are supported, excepted the influence of transaction risk and credit risk on perceived usefulness (Table 3). Therefore, all hypotheses are accepted, except H7 and H10.

6. Discussion

This study has 12 hypotheses about causal relationships among latent factors in the research model. These hypotheses are tested based on SEM analysis. The results of hypothesis testing are detailed:

The empirical results show that perceived usefulness is the second strongest motivator of intended use (H1 is

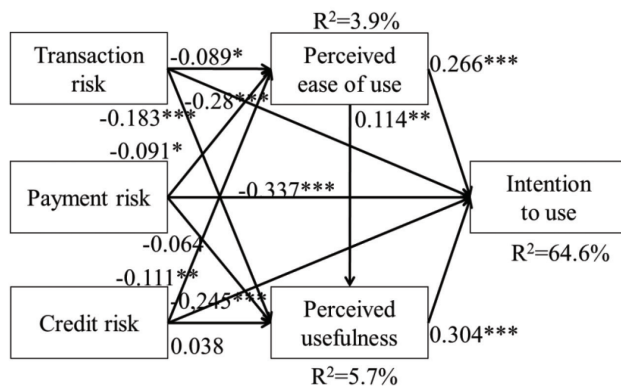


Figure 3: Proposed Research Model and the Results of SEM

accepted). Vietnamese consumers are more likely to increase their intention to use credit cards when they think that using them will make their payments more efficient. Whereby, consumers appreciate credit cards on the ability to purchase without carrying cash, buy first and repay later, installment purchases in free of interest, free charge for up to 45 days or flexibly borrow and repay. With the influencing level of $\beta = 0.304$, this study is consensus, and even outperformed most previous studies on credit card adoption (Jamshidi & Hussin, 2016; Tan et al., 2014).

Results from SEM reveal that perceived ease of use has a positive effect on both perceived usefulness and intention to use (H2, H3 are accepted), which are consistent with prior studies (Jamshidi & Hussin, 2016; Nguyen & Cassidy, 2018). This means consumers are more likely to adopt credit cards when they feel easy to learn, easy to use them. They are also interested in using credit cards on many devices without no constraints on space and time. However, the impact of perceived ease of use on intent to use is relatively weak compared to others. This may be due that some consumers ignores the relationship between ease of use and intent to use; others decline for no reason at all, or are ready to use whether easy or not.

The study provides a measurement for perceived transaction risk on credit cards as an assessment of potential losses related to e-transactions. Consumers may worry about the possibility of unauthorized personal information collection and being bothered by unknown people. It also disturbs them about the loss of security when transmitting financial data through connected e-devices or being attacked by cyber-crimes. SEM results determine a negative effect of transaction risk on perceived usefulness, ease of use and intention to use (H4, H5, H6 are accepted). These findings are consistent with prior studies on e-services (Hansen et al.,

Table 3: Results of the Structural Equation Model

Hypothesis	Relationship	Estimate	S.E.	C.R.	P	Result
H1	PUS → IU	0.304	0.043	8.137	***	Accepted
H2	PES → PUS	0.114	0.035	2.401	0.016	Accepted
H3	PES → IU	0.266	0.029	7.635	***	Accepted
H4	PTR → PUS	-0.183	0.031	-3.679	***	Accepted
H5	PTR → PES	-0.089	0.041	-1.846	0.065	Accepted
H6	PTR → IU	-0.280	0.027	-7.564	***	Accepted
H7	PPR → PUS	-0.064	0.028	-1.288	0.198	Declined
H8	PPR → PES	-0.091	0.038	-1.865	0.062	Accepted
H9	PPR → IU	-0.337	0.024	-9.059	***	Accepted
H10	PCR → PUS	0.038	0.035	0.802	0.423	Declined
H11	PCR → PES	-0.111	0.047	-2.355	0.019	Accepted
H12	PCR → IU	-0.245	0.03	-6.979	***	Accepted

2018). However, in the increasingly developed information technology, consumers become attached to smart devices; they are less interested in damages related to them. As a result, the impact of transaction risk on intended use in this study is only the third largest of the five factors considered.

Another dimension of perceived risk is payment risk, which focuses on consumers' assessment of the potential losses related to paying bills with credit cards. Factor analyses results show that consumers worry about paying much money to use, failing to pay bills because it is defective or expired, taking much time to troubleshoot and resolve complaints and being under pressure of the transaction until its confirmation. The results suggest that payment risk influence negatively perceived ease of use and intention to use (H8, H9 are accepted). Consumers' concerns about potential losses with e-payments makes them feel it takes more time and effort to learn to use and use proficiently and then let them being inclined to not use as supported by Hansen et al. (2018), Mutahar et al. (2018), Trinh and Vuong (2019). However, the hypothesis H7 is rejected, so the degree to which a person believes that using credit card would enhance his daily payments does not depend on how he assesses its potential damages.

This study proposes credit risk as a fresh dimension of perceived risk as the degree to which consumers consider potential losses from borrowing with credit cards. They worry about paying high interest on credit card debt, paying interest on fraudulent transactions, falling into debt and being despised for debt and inability to repay. SEM analysis results do not support the effect of credit risk on perceived usefulness (H10 is rejected). However, this study confirms the negative influences of perceived credit risk on perceived ease of use and intention to use (H11, H12 are accepted). The potential losses associated with borrowing and repaying make individuals feel it takes more time and effort to use proficiently (Hansen et al., 2018; Mutahar et al., 2018), and then discourage them adopting credit cards. The findings provide important evidence of the relationship between perceived risk on consumer loans and intended use of credit cards, which has never been mentioned before.

7. Conclusion

This study is a pioneering effort in credit card adoption by proposing a theoretical model of factors affecting consumer intended use of credit cards, including perceived risk, perceived usefulness and perceived ease of use. Despite of perspective of consequences in prior studies, this study focuses on the sources of perceived risk on credit cards, which can help banks in improving their credit card business. Three dimensions of perceived risk on credit cards in sources of risk, including transaction, payment, and credit risks, are defined and measured in a preliminary research.

Using data collected from 538 bank customers, this study measures 6 research concepts with 26 observed variables. A measurement and a structural model are consistent with market data. The study accepts 10 out of 12 proposed hypotheses, which show that payment risk, usefulness, transaction risk, ease of use, and credit risk influence intended use of credit cards in decreasing order of influence. These factors account for 64.6% of the variation in intended use. All three dimensions of perceived risk have a negative effect on the intention to use, with the total impact greater than the level of influence of the other two factors of usefulness and ease of use.

Besides the results achieved, the study also has some limitations. This study explains consumers' intention to use credit cards by integrating TPR and TAM. Attitudes towards debt and perceived demand, which may be important in one's decision to take consumer loans, were not mentioned. Perceived risk is a human cognitive state that can be affected by information system quality as an environmental stimulus. Future studies may focus on clarifying perceived demand, attitude to debt as a motivator of intended use, or information system quality as an inhibitor of perceived risk to address these shortcomings.

This study can be beneficial to banks in enacting policies to attract more consumers and to allocate resources for improving their credit card business. Based on factors influencing consumers' intended use, banks may encourage them to own and use credit cards for billing. The positive influence of perceived usefulness, perceived ease of use can be exploited in framing or refining the transactional procedures or relevant services. Similarly, changing consumers' perception toward credit cards should be carried out seriously and continuously to help them overcome subjective losses on transaction risk, payment, and credit risks. Consumers should be provided with adequate information about credit cards including utilities, functionalities, fees, penalties, arisen problems and their suitable solutions. This information gives them more comprehensive view of credit cards. Once consumers are fully aware of credit cards, they are more likely to own and use credit cards easily, beneficially and certainly. Therefore, they will be ready to adopt and use it for daily payments.

References

- Amin, H. (2007). An analysis of mobile credit card usage intentions. *Information Management & Computer Security*, 15, 260–269.
- Amin, H. (2013). Factors influencing Malaysian bank customers to choose Islamic credit cards: Empirical evidence from the TRA model. *Journal of Islamic Marketing*, 4, 245–263.
- Bauer, R. A. (1960). *Consumer Behavior as Risk Taking, Dynamic marketing for a changing world*. Chicago, IL: American Marketing Association.

- Cabanillas, F. L., Leiva, F. M., & Fernandez, J. S. (2018). A global approach to the analysis of user behavior in mobile payment systems in new electronic environment. *Service Business*, 12, 25–64.
- Cheu, S. P., & Loke, Y. J. (2010). Credit cardholder: Convenience user or credit revolver? *Malaysian Journal of Economic Studies*, 47, 1–17.
- Cox, D. F., & Rich, S. U. (1964). Perceived risk and customer decision making - the case of telephone shopping. *Journal of Marketing Research*, 1(4), 32–39.
- Davis, F., Bagozzi, R., & Warshaw, P. (1989). User Acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003.
- Featherman, M., & Pavlou, P. A. (2003). Predicting e-services adoption: A perceived risk facets perspective. *International Journal of Human Computer Studies*, 59, 451–474.
- Foscht, T., Maloles, C., Swoboda, B., & Chia, S. (2010). Debit and credit card usage and satisfaction. *International Journal of Bank Marketing*, 28, 150–165.
- General Statistics Office of Vietnam (2020). *Data of Population and Employment*. Retrieved December 12, 2020, from <https://www.gso.gov.vn/en>
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2014). *Multivariate data analysis*, 7th edn. USA: Pearson Education.
- Hansen, J., Saridakis, G., & Benson, V. (2018). Risk, trust, and the interaction of perceived ease of use and behavioral control in predicting consumers' use of social media for transactions. *Computers in Human Behavior*, 80, 197–206. <https://doi.org/10.1016/j.chb.2017.11.010>
- Herrero, A., & Martin, H. S. (2012). Effects of the risk sources and user involvement on e-commerce adoption. *Journal of Risk Research*, 15(7), 841–855.
- Jamshidi, D., & Hussin, N. (2016). Forecasting patronage factors of Islamic credit card as a new e-commerce banking service. *Journal of Islamic Marketing*, 7, 378–404.
- Kaynak, E., & Harcar, T. (2001). Consumers' attitudes and intentions towards credit card usage in an advanced developing country. *Journal of Financial Services Marketing*, 6, 24–39.
- Lim, N. (2003). Classification of Consumers' Perceived Risk: Sources versus Consequences. *Electronic Commerce Research and Applications*, 2, 540–554.
- Morteson, M., & Vidgen, R. (2016). A computational literature review of the technology acceptance model. *International Journal of Information Management*, 36, 1248–1259.
- Mutahar, A., Daud, N., Ramayah, T., Isaac, O., & Aldholay, A. (2018). The effect of awareness and perceived risk on the technology acceptance model (TAM): mobile banking in Yemen. *International Journal of Services and Standards*, 12, 180–204.
- Nguyen, O. D. Y., & Cassidy, J. (2018). Consumer intention and credit card adoption in Vietnam. *Asia Pacific Journal of Marketing and Logistics*, 30, 779–796.
- Park, J., Lee, D., & Ahn, J. (2004). Risk-Focused E-Commerce Adoption Model : A Cross-Country Study. *Journal of Global Information Technology Management*, 7, 6–30.
- Pelaez, A., Chen, C., & Chen, Y. X. (2019). Effects of Perceived Risk on Intention to Purchase: A Meta-Analysis. *Journal of Computer Information Systems*, 59, 73–84.
- Phan, D. T. T., Nguyen, T. T. H., & Bui, T. A. (2019). Going beyond Border? Intention to Use International Bank Cards in Vietnam. *Journal of Asian Finance, Economics and Business*, 6(3), 315–325. <https://doi.org/10.13106/jafeb.2019.vol6.no3.315>
- Rattanaburi, K., & Vongurai, R. (2020). Factors influencing actual usage of mobile shopping applications: Generation Y in Thailand. *Journal of Asian Finance, Economics and Business*, 8(1), 901–913. <https://doi.org/10.13106/jafeb.2021.vol8.no1.901>
- Roselius, T. (1971). Consumer rankings of risk reduction methods. *Journal of Marketing*, 35, 56.
- Seetharama, A., Patwa, N., Niranjana, I., & Kavuri, S.P. (2016). The Impact of Increased Credit Card Usage on Costs Incurred by Merchant Establishments in Singapore. *Journal of Asian Finance, Economics and Business*, 3(4), 43–56. <https://doi.org/10.13106/jafeb.2016.vol3.no4.43>
- State Bank of Vietnam (2020). *Statistics in Settlement Activities*. Retrieved December 12, 2020, from <https://www.sbv.gov.vn/webcenter/portal/en/home/sbv/statistic/settleactiv/nobc>
- Tan, G., Ooi, K., Chong, S., & Hew, T. (2014). NFC mobile credit card: The next frontier of mobile payment? *Telematics and Informatics*, 31, 292–307.
- Tandon, U., Kiran, R., & Sah, A. N. (2018). The influence of website functionality, drivers and perceived risk on customer satisfaction in online shopping: an emerging economy case. *Information Systems and e-Business Management*, 16, 57–91.
- Trinh, H. N., & Vuong, D. H. Q. (2019). Multi-dimensional Analysis of Perceived Risk on Credit Card Adoption. *ECONVN 2019 Studies in Computational Intelligence*, 809, 606–620.
- Tseng, S. (2016). Bringing Enjoy Shopping by Using Credit Cards: The Antecedents of Internal Beliefs. *Journal of Economics and Economic Education Research*, 17, 16.
- Turban, E., Outland, J., King, D., Lee, J., Liang, T., & Turban, D. (2018). *Electronic Commerce: A Managerial and Social Networks Perspective*. Cham: Springer International Publishing.
- Vuong, D. H. Q., & Trinh, H. N. (2017). Developing credit card market from Vietnamese consumers' perspective. *Journal of Science HCMC Open University*, 21(1), 61–75.
- Wang, S., & Hsu, M. (2016). Airline co-branded credit cards-An application of the theory of planned behavior. *Journal of Air Transport Management*, 55, 245–254.
- World Bank. (2020). *Data of Vietnam*. Retrieved December 12, 2020, from <https://data.worldbank.org/country/vietnam>
- World Bank. (2020). *Global Financial Index Report*. Retrieved December 12, 2020, from <https://globalindex.worldbank.org/>