

Determinants of consumers' intention to use credit card: a perspective of multifaceted perceived risk

Consumers'
intention to
use credit card

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Abstract

Purpose – The purpose of this study is to develop a theoretical model for consumer behavioral intention by integrating the technology acceptance model (TAM) and the theory of perceived risk, which is tested on the intended use of credit cards in Vietnam.

Design/methodology/approach – The data were collected from 485 bank customers through a nationwide online survey. An exploratory and confirmatory factor analyzes were performed to validate the factor structure of the measurement items while structural equation modeling was used to validate the proposed model and testing the hypotheses.

Findings – The results of structural equation modeling reveal that perceived risk, perceived usefulness, social influence and perceived ease of use were significant determinants of consumer intention to use a credit card. Of them, only perceived risk discouraged the intended use of a credit card, which was synthesized from psychological, financial, performance, privacy, time, social and security risk.

Research limitations/implications – This study measured the first-order risk dimensions based on the payment function of the credit card only; these measurements missed potential losses relevant to credit function of credit cards.

Practical implications – This study can be beneficial to banks enacting policies to attract more consumers and to help decide how to allocate resources to retain and expand their customer base.

Originality/value – The study adds value to the literature on consumer behavior by confirming the impact of second-order perceived risk on the intended use of credit cards, which most previous studies have not demonstrated. The research also provides an empirical evidence to the academic research platform on e-banking services in Vietnam, especially related to the credit card industry.

Keywords Vietnam, Perceived risk, Behavioral intention, Credit card

Paper type Research paper

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1. Introduction

Credit cards, a combination of payment card and personal consumption credit, are widely used in around the world. Starting with a relationship between vendors and consumers, as well as a need to buy first and pay later, Franklin National Bank in New York, the USA, issued first-ever credit cards to market in 1951. Year after year, the rapid development of consumer demand for credit cards exceeded the bank's responsibility and management capacity. Consequently, many international credit card organizations have been established and operated independently around the world with six famous brands including American Express, Diners Club, Japan credit bureau, Visa, MasterCard and Chinese union pay. Banks join these institutions and are licensed to issue and acquire credit cards. To expand the credit card market segment, banks are constantly issuing cards to new customers and encouraging existing customers using them in daily spending. Based on practical requirements, many researchers are interested in consumer intended and actual use of credit cards.

Studies of consumer behavior on credit cards have mainly focused on the decisive role of individual demographic characteristics, credit card attributes and personal perception about credit cards. Some authors proved that differences in demographics such as age, gender, occupation and financial status lead to differences in his intention to use credit cards (Dewri *et al.*, 2016; Foscht *et al.*, 2010; Porto and Xiao, 2019). Others have confirmed that consumers decide to use credit cards because of their advantages compared to other payment methods such as cash, e-money or debit card (Chahal *et al.*, 2014; Ooi and Tan, 2016; Qureshi *et al.*, 2018). Assuming consumers are always rational in their behavior (Fishbein and Ajzen, 1975), some authors believed that a person decides using credit cards because of their ability to finance his daily expenses effectively (Porto and Xiao, 2019; Tan *et al.*, 2014; Trinh and Vuong, 2017). Moreover, some empirical studies have highlighted that social groups such as family, friends and colleagues have a significant influence on consumer intended use of credit cards (Ali *et al.*, 2017; Amin, 2013; Tan *et al.*, 2014; Varaprasad *et al.*, 2013).

Reasonable consumers are not only interested in the benefits of using a credit card but also they care about their potential losses (Fishbein and Ajzen, 1975; Mitchell, 1999). Many authors agreed that perceived risk is a major barrier to the intended use of e-services (Roy *et al.*, 2017; Yang *et al.*, 2015). Similarly, perceived risk has been considered as a deciding factor for the intention to use credit cards (Nguyen and Cassidy, 2018; Tan *et al.*, 2014; Tseng, 2016; Varaprasad *et al.*, 2013). However, their outcomes were inconsistent; perceived risk had significantly negative impact (Nguyen and Cassidy, 2018), significantly positive influence (Varaprasad *et al.*, 2013) or insignificant effect on consumer intended use of credit cards (Tan *et al.*, 2014; Tseng, 2016).

As the credit card market becomes more competitive, a better understanding of consumer behavior becomes imperative for banks. However, unlike previous research studies, this study focuses on the impact of perceived risk on the intended use of credit cards. To achieve this goal, the study begins with a brief review of consumer behavior. As a result, a theoretical model and testable hypotheses are developed, followed by the methodology and data collected. The findings are described and discussed before making some conclusions, as well as future research directions.

2. Literature review and proposed theoretical model

2.1 Literature review

Several research frameworks have been developed over the years to explain consumer intended and actual behavior. Prominent among them, theory of perceived risk (TPR) (Bauer, 1960) focuses on how consumers are concerned about the potential losses that influence on their intention in a specific purchase situation. However, consumers are not

only risk averse but also rational; they intent to do something when they find this behavior useful, easy to do or they are encouraged by influencers, which are inherited from theory of reasoned actions (Fishbein and Ajzen, 1975), technology acceptance model (TAM) (Davis *et al.*, 1989), theory of planning behavior (TPB) (Ajzen, 1991) or unified theory of acceptance and use of technology (UTAUT) (Venkatesh *et al.*, 2003). These theories are applied independently or together in many studies on consumer intended use of e-services (Alalwan *et al.*, 2017; Liu *et al.*, 2019; Pelaez *et al.*, 2019; Tam and Oliveira, 2017).

Credit card is a technology product, used on electronic devices with two basic functions, namely, payment and credit (Foscht *et al.*, 2010). Credit cardholder can buy first, pay later based on the bank's commitment (Amin, 2013). Accordingly, the issuing bank will pay the biller on behalf of the cardholder, who is responsible for returning full and timely (Foscht *et al.*, 2010). In modern commerce, credit cards are becoming increasingly important and popular all over the world (Porto and Xiao, 2019). Studies on credit cards are conducted and published in prestigious scientific journals, in which perceived risk from TPR, perceived usefulness from TAM/UTAUT, perceived ease of use from TAM/TPB/UTAUT and social influence from TPB/UTAUT are frequently used to predict consumer intended use of credit cards. These concepts are briefly described as followed:

Perceived usefulness was proposed as the degree to which a person believes that using a particular system would enhance his/her performance (Davis *et al.*, 1989; Venkatesh *et al.*, 2003). Credit cards are appreciated for non-cash payments and personal consumer credit (Chahal *et al.*, 2014). Consumers prefer credit cards due to uncertainty when carrying cash (Khare *et al.*, 2012) or special discounts from famous brands (Dali *et al.*, 2015). They use credit cards as a source of revolving credit with long grace period (Chahal *et al.*, 2014; Khare *et al.*, 2012). They can even withdraw cash by credit cards as required (Chahal *et al.*, 2014). As a result, consumer appreciate the performance of credit card usage, so they are more likely to use it in their daily expenses (Amin, 2013; Nguyen and Cassidy, 2018; Ooi and Tan, 2016; Trinh and Vuong, 2017; Varaprasad *et al.*, 2013).

Ajzen (1991) and Davis *et al.* (1989) considered perceived ease of use as the degree to which a person believes that using a particular system would be easy. Ajzen (1991) assumed that this perception is determined by a total set of accessible control beliefs. Qureshi *et al.* (2018) stated consumers are easy to register a credit card with a quick and simple procedure. Chahal *et al.* (2014) and Dali *et al.* (2015) posited credit card's non-stop usability in numerous electronic devices. Moreover, the credit card payment process is so simple that cardholders do not need much effort to learn and use it regularly (Khare *et al.*, 2012). Consequently, many studies have confirmed that consumers appreciate credit cards and tend to use them for daily (Ali *et al.*, 2017; Amin, 2013; Nguyen and Cassidy, 2018; Porto and Xiao, 2019; Trinh and Vuong, 2017; Tseng, 2016).

Social influence referred to a degree to which a consumer perceives that important people believe that he/she should or should not perform a particular behavior (Ajzen, 1991; Venkatesh *et al.*, 2003). Consumers are irresistible to observe and evaluate credit card features, they feel uncomfortable when their friends, colleagues always use and talk about them (Qureshi *et al.*, 2018). Amin, 2013 argued that consumers tend to acquire and imitate the financial attitudes behaviors of family members. Moreover, media, which is designed specifically to reach a large audience or viewers has contributed to raising consumer awareness about credit cards (Ali *et al.*, 2017). Empirical evidence suggested that social groups' perspective may enhance one's intended use of credit cards (Ali *et al.*, 2017; Amin, 2013; Nguyen and Cassidy, 2018; Trinh and Vuong, 2017; Varaprasad *et al.*, 2013). However, Leong *et al.* (2013) suggested that social influence only effects indirectly on the intended use of credit cards through perceived usefulness and perceived ease of use.

Perceived risk, in consumer behavior perspective, refers primarily to consumer subjective expectations for incident losses (Bauer, 1960; Featherman and Pavlou, 2003). Consumers are granted a credit line to pay their bills, and they must spend a lot of time, money and effort to use it safely and effectively (Chahal *et al.*, 2014; Yang *et al.*, 2015). However, their payments are not always successful because of operational breakdowns or system malfunctions (Varaprasad *et al.*, 2013). Meanwhile, the losses of personal privacy and system security are serious and consumers may be accounted until the authorities clarify the responsibilities of stakeholders (Tan *et al.*, 2014; Tseng, 2016). As a result, consumers are less like to use credit cards when they are deeply concerned about their uncertainty (Nguyen and Cassidy, 2018). However, some studies found that user's credit card adoption is not from how they perceives the losses caused by its use (Tan *et al.*, 2014; Tseng, 2016). Varaprasad *et al.* (2013) argued that the bank's efforts make consumers choose credit cards even if they are afraid of un-expectations caused by this type of payment instrument. Despite some differences, most of these studies have shared a one-dimensional approach to perceived risk on credit cards. This approach refers perceived risk as a common perception, defined by several observed variables, and therefore, does not reflect consumer valuation of different types of potential losses relevant to credit card use.

2.2 Proposed research model

Based on the above review about consumer behavior and prior studies on the intention to use credit cards, the study proposes a theoretical model of the intended behavior by integrating some prominent adoption theories. The model suggests perceived risk, usefulness, ease of use and social influence as exploratory factors to predict consumer intended use of credit cards. These constructs and their hypotheses are described below:

Perceived usefulness is one of the most important factors in TAM and has been studied comprehensively as a main determinant of consumer adoption of modern electronic services, including e-shopping (Chhonker *et al.*, 2017), e-payment (Liu *et al.*, 2019) and e-banking (Zhang *et al.*, 2018). In the context of credit cards, perceived usefulness can be considered as an indicator of the degree to which a person believes that using a credit card would enhance his/her payment for daily expenses. Empirical evidences showed that perceived usefulness plays an important role in consumer intended use of credit cards (Leong *et al.*, 2013; Nguyen and Cassidy, 2018; Tan *et al.*, 2014; Trinh and Vuong, 2017; Tseng, 2016; Varaprasad *et al.*, 2013). Therefore, this study hypothesizes that:

H1. Perceived usefulness affects positively the intention to use credit cards.

Consumers are rational, who are not only interested in benefits but also in losses whenever they make decision, especially for those behaviors, which they cannot see or touch, just feel only how they work. These concerns are mentioned as the risk perceptions, which were first proposed in TPR (Bauer, 1960). Nowadays, this concept becomes more seriously in the context of e-services, where data are transferred between connected e-devices. Such e-transactions are invisible to consumers, who may be faced to unexpected outcomes and this may prevent them to perform behaviors. Some literature reviews about perceived risk are conducted in technology adoption, including e-shopping (Pelaez *et al.*, 2019), e-payment (Patil *et al.*, 2018) and e-banking (Mutahar *et al.*, 2018). Among many approaches of using perceived risk in studies on consumer intended use of technology, (Featherman and Pavlou, 2003; Hanafizadeh and Khedmatgozar, 2012) summarized perceived risk is situation specific and is considered as a second-order factor, which is commonly formed by performance, financial, social, time, psychological, security, privacy factors (Table 1). This approach has

		Consumers' intention to use credit card
Dimension of perceived risk	Definition	
FIR	Potential financial losses due to purchasing a subscription to a poorly performing e-service or potential internet-based fraud	
PER	Potential performance problems, malfunctioning, transaction processing errors, reliability and/or security problems, and therefore, not performing as expected	
SOR	Potential losses to their perceived status in their social group as a result of using an e-service	109
PSR	Potential losses to their self-esteem, peace of mind or self-perception (ego) due to worrying, feeling frustrated, foolish or stressful as a result of using an e-service	
TIR	Potential losses to convenience, time and effort caused by wasting time researching, purchasing, setting up, switching to and learning how to use the e-service	
SER	Potential losses involving transmitting sensitive data through e-services that breach technological data protection	
PRR	Potential losses to the privacy and confidentiality of their personally identifying information and that e-service usage exposes them to potential identity theft	
Sources: Featherman and Pavlou (2003); Hanafizadeh and Khedmatgozar (2012)		Table 1. Multi-dimensional perceived risk

been used in many empirical studies (Martins *et al.*, 2014; Mutahar *et al.*, 2018; Tandon *et al.*, 2016; Yang *et al.*, 2015). As such, this study hypothesizes that:

H2. Perceived risk is a second-order construct of seven first-order risks, including financial, performance, psychological, social, time, security and privacy risk.

H2a-g. Financial, performance, psychological, social, time, security and privacy risk perception have positively related to perceived risk.

Perceived risk, the main construct of TPR, is often considered as a main barrier of consumer intention to use e-services. Its negative effect on behavioral intentions has been confirmed in e-services (Cao and Niu, 2019; Martins *et al.*, 2014; Mutahar *et al.*, 2018; Roy *et al.*, 2017; Tandon *et al.*, 2016). These researchers agreed that the more consumers' aversion to potential losses are lowered, the more they are likely to adopt e-services. They also found that only individuals who perceive using an e-service as a low-risk undertaking would have a tendency to perceive it as useful. Therefore, this study hypothesizes that:

H3. Perceived risk affects negatively perceived usefulness on credit cards.

H4. Perceived risk affects negatively the intention to use credit cards.

Perceived ease of use is another important factor in TAM and has been mentioned as a main antecedent of consumer intended use of modern electronic services, including e-shopping (Chhonker *et al.*, 2017), e-payment (Liu *et al.*, 2019) and e-banking (Zhang *et al.*, 2018). Based on original TAM (Davis *et al.*, 1989), this study describes credit card's perceived ease of use as the perception of complexity to learn and use for potential customers when adopting to a credit card. Empirical evidences showed that perceived ease of use have a direct effect on the intended use of credit cards or indirect influence by mediating the perceived usefulness (Leong *et al.*, 2013; Nguyen and Cassidy, 2018; Tan *et al.*, 2014; Trinh and Vuong, 2017; Tseng, 2016; Varaprasad *et al.*, 2013). Therefore, this study hypothesizes that:

H5. Perceived ease of use affects positively perceived usefulness on credit cards.

H6. Perceived ease of use affects positively the intention to use a credit card.

Social influence was proposed in TPB (Ajzen, 1991), UTAUT (Venkatesh *et al.*, 2003) and became an indispensable construct in studies on technology adoption (Chhonker *et al.*, 2017; Liu *et al.*, 2019; Zhang *et al.*, 2018). As a member of a community, consumers are very influenced by the surrounding friends, colleagues, especially who are important to them. These influences may be great motivation in the early stages of adoption, when consumers have a limited knowledge or experience of a new technology (Venkatesh *et al.*, 2003). This study supposes social influence as a degree to which consumer perceives that important others such as family, peers and colleagues believe he/she should adopt and use a credit card in daily consumption. Empirical studies confirmed that consumers are directly influenced by social groups in their behavioral intention (Cao and Niu, 2019; Malaquias and Hwang, 2019; Martins *et al.*, 2014; Sripalawat *et al.*, 2011). Meanwhile, Liébana *et al.* (2017) and Pelaez *et al.* (2019) found that consumer's perception on new technology's performance may change depending on whether his important influencers appreciate it, then, in turn, their opinions encourage him adopting this technology. Therefore, this study hypothesizes that:

H7. Social influence affects positively perceived usefulness on credit card.

H8. Social influence affects positively intended use of credit card.

Based upon above discussions, a theoretical model is developed to predict consumer intended use of credit cards with four explanatory factors, including perceived usefulness, perceived risk, perceived ease of use and social influence, where perceived risk is a second-order construct related to seven first-order risk dimensions, including financial, performance, social, psychological, time, security and privacy risk (Figure 1).

3. Methodology

The empirical data for this study are obtained through an online survey, which were based on our review of prior studies relevant to the proposed theoretical model. Some expressions were customized to fit the context of credit cards. The research was anchored on a five-point Likert-type scale measurement varying from "1 (strongly disagree)" to "5 (strongly agree)." A pre-test was also performed with five banking experts with a background on credit cards to ensure that the questionnaire has no semantic problems. Some modifications of content and structure were amended based on the provided feedback. The instruments were then further pilot-tested with 15 consumers, who have experienced in using credit cards for paying bills. Insignificant changes were made to the wordings resulted from the tests. A final questionnaire focuses on 11 first-order constructs corresponding to the proposed model with 46 questions asked (Table 2).

The survey was conducted by using 724 respondents selected through convenient sampling of Vietnamese bank customers, who are potential customers encouraged by the bank to register and use credit cards. Only 485 responses were valid and usable, yielding a valid response rate of 67% among volunteered participants. With 46 observed variables, the required sample size is from 138 to 230 (Cattell, 1978). The data from 485 respondents are, therefore, compatible. Based on collected data, both exploratory factor analysis and confirmatory factor analysis (CFA) are conducted to select and arrange the significant variables to particular factors (Byrne, 2010; Hair *et al.*, 2014). Finally, structural equation modeling is used for building the model of determinants of the intention to use credit cards (Anderson and Gerbing, 1991; Byrne, 2010).

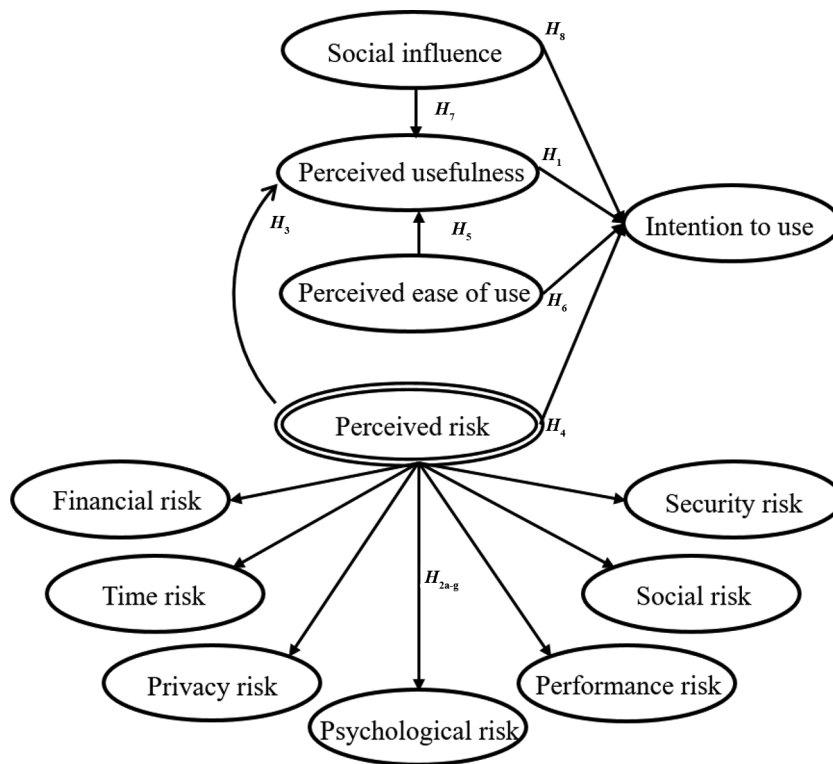


Figure 1.
Proposed theoretical
model

Constructs	No. of items	Sources
Perceived usefulness (PU)	7	Trinh and Vuong (2017)
<i>Perceived risk (PR)</i>		
FIR	4	Hanafizadeh and Khedmatgozar (2012)
PER	4	Yang <i>et al.</i> (2015)
SOR	4	Yang <i>et al.</i> (2015)
PSR	3	Yang <i>et al.</i> (2015)
TIR	3	Yang <i>et al.</i> (2015)
SER	4	Hanafizadeh and Khedmatgozar (2012)
PRR	4	Hanafizadeh and Khedmatgozar (2012)
Perceived ease of use (EOU)	5	Trinh and Vuong (2017)
Social influence (SI)	4	Trinh and Vuong (2017)
Intention to use credit card (IU)	4	Trinh and Vuong (2017)

Table 2.
Questionnaire source
and number of items

4. Findings

4.1 Profile of respondents and intention to use credit cards

The data presented in Table 3 provides the demographic details on a gender, marital status, occupation, age and highest level of academic qualification of the respondents. These controlled variables are considered in this study based on prior studies relevant to consumers' intended use of credit cards. Prior studies supposed that the differences in these

Table 3.
Descriptive statistics
and mean
comparative analysis

Variable	Freq.	(%)	Mean
<i>Gender: ANOVA 0.132</i>			
Female	236	48.7	3.72
Male	249	51.3	3.62
<i>Age: ANOVA 0.147</i>			
Under 35	207	42.7	3.73
From 35 to 45	147	30.3	3.71
Above 45	131	27.0	3.68
<i>Regular income: ANOVA 0.160</i>			
Under 500	89	18.4	3.70
500–900	208	42.9	3.66
900–1,600	131	27.0	3.61
1,600–3,200	46	9.4	3.74
Above 3,200	11	2.3	4.18
<i>Marital status: ANOVA 0.644</i>			
Single	187	38.6	3.65
Married	298	61.4	3.68
<i>Education: ANOVA 0.166</i>			
College and lower	99	20.5	3.65
Graduated	217	44.7	3.71
Higher graduated	169	34.8	3.70
<i>Occupation: ANOVA 0.274</i>			
Industries	73	15.1	3.62
Trading services	128	26.4	3.66
Financial services	123	25.4	3.76
Public services	148	30.5	3.68
Other	13	2.6	3.31

demographic characteristics may lead to the differences in the intention to use credit cards (Dewri *et al.*, 2016; Porto and Xiao, 2019; Qureshi *et al.*, 2018).

Of our samples, majority of the respondents are male (51.3%), married (61.4%) compared to female (48.7%) and single (38.6%). Survey participants are mostly young adulthood with 73% of them below the age of 45. The results also show that 20.5% of respondents have college education; 44.7% of them are graduated and 34.8% remaining are post-graduated. Regarding the respondents' occupation, their largest proportion belongs to public services (30.5%), followed by trading services (26.4%), financial services (25.4%) and industries (15.1%). However, the one-way ANOVA tests in comparing means of intention to use credit card insist that there is no significant difference between independent groups divided by these demographic variables, which is inconsistent to prior studies (Dewri *et al.*, 2016; Porto and Xiao, 2019; Qureshi *et al.*, 2018).

4.2 Factor analysis

Applying exploratory factor analysis on data collected from survey questionnaires, 10 factors are extracted from 39 observed variables, except PU4, FIR1, SOR1, which are eliminated from the analysis because its loading factors are less than 0.5 (Hair *et al.*, 2014). These extracted factors are suitable to the proposal model (Table 4). The Kaiser-Meyer-Olkin measure coefficient is 0.847 with a statistical significance of 0.000, indicates that the exploratory factor analysis (EFA) of the

Construct	Loading coefficients		Correlated item-total
	EFA	CFA	
<i>Perceived usefulness (PU): Eigenvalues = 7.097; CR = 0.861; AVE = 0.519</i>			
PU1. Purchase without carrying cash	0.719	0.771	0.680
PU2. Buy first and repay later	0.844	0.784	0.714
PU3. Pay the bill	0.593	0.637	0.590
PU4. Cash withdraw at ATM			
PU5. Installment purchase	0.774	0.766	0.722
PU6. Free of interest for up to 45 days	0.656	0.675	0.608
PU7. Revolving credit	0.635	0.674	0.618
<i>Perceived ease of use (EOU): Eigenvalues = 2.839; CR = 0.870; AVE = 0.606</i>			
EOU1. Simple registration	0.699	0.684	0.650
EOU2. Use credit card easily	0.854	0.839	0.775
EOU3. Learn to use easily	0.927	0.913	0.810
EOU4. Ease to use	0.825	0.827	0.739
EOU5. Use everywhere and every time	0.549	0.581	0.555
<i>Social influence (SI): Eigenvalues = 2.331; CR = 0.853; AVE = 0.593</i>			
SI1. Family	0.736	0.724	0.659
SI2. Friends	0.762	0.791	0.708
SI3. Colleagues	0.794	0.791	0.717
SI4. Multi-media	0.759	0.772	0.691
<i>Perceived SER: Eigenvalues = 2.759; CR = 0.914; AVE = 0.724</i>			
SER1. Credit card may be copied or counterfeited	0.860	0.844	0.794
SER2. Payment via website is unsecured	0.865	0.856	0.811
SER3. Payment on ATM/POS is unsecured	0.826	0.847	0.799
SER4. Payment systems may be attacked or hacked	0.848	0.856	0.811
<i>Perceived PRR: Eigenvalues = 5.528; CR = 0.927; AVE = 0.763</i>			
PRR1. Personal information is collected	0.883	0.884	0.836
PRR2. Personal information is shared in internet	0.903	0.88	0.837
PRR3. Personal information is used illegally	0.852	0.842	0.806
PRR4. Personal information is hijacked	0.879	0.887	0.844
<i>Perceived PER: Eigenvalues = 1.803; CR = 0.813; AVE = 0.523</i>			
PER1. Unusable due to technical errors	0.645	0.727	0.621
PER2. Insatiable my spending needs	0.826	0.757	0.668
PER3. Do not help me control spending	0.717	0.701	0.624
PER4. Not well-performed as advertised	0.664	0.707	0.617
<i>Perceived FIR: Eigenvalues = 1.615; CR = 0.814; AVE = 0.593</i>			
FIR1. It will cost me money to use credit card			
FIR2. Lose by my typing mistakes	0.668	0.7	0.614
FIR3. Lose by others' unlawful activity	0.820	0.799	0.702
FIR4. There is no compensation for lost money	0.786	0.806	0.679
<i>Perceived TIR: Eigenvalues = 1.556; CR = 0.827; AVE = 0.623</i>			
TIR1. It takes time to learn how to use	0.848	0.844	0.730
TIR2. It takes time to perform transactions	0.771	0.725	0.645
TIR3. It takes time to solve problems	0.737	0.795	0.677

(continued)

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use credit card

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Table 4.
Factor analysis

Table 4.

Construct	Loading coefficients		Correlated item-total
	EFA	CFA	
<i>Perceived SOR: Eigenvalues = 1.951; CR = 0.875; AVE = 0.704</i>			
SOR1. My relatives discourage me			
SOR2. I am judged negatively by others	0.831	0.833	0.754
SOR3. I look foolish to others	0.881	0.879	0.790
SOR4. No direct support from service providers	0.794	0.803	0.741
<i>Perceived PSR: Eigenvalues = 1.243; CR = 0.749; AVE = 0.525</i>			
PSR1. I feel anxious	0.715	0.694	0.575
PSR2. I feel frustrated	0.737	0.881	0.666
PSR3. I feel depressed	0.626	0.564	0.493
<i>Intention to use credit card (IU): Eigenvalues = 3.355; CR = 0.934; AVE = 0.788</i>			
IU1. I am desire to use	0.867	0.877	0.829
IU2. I plan to use	0.930	0.927	0.884
IU3. I use it as soon as possible	0.922	0.913	0.879
IU4. I will use it usually in the future	0.825	0.831	0.797

independent components is appropriate. A total extracted variance of variables is 62.944%, greater than 50% as required by (Anderson and Gerbing, 1991). Observed variables in intention to use credit cards (IU) have high loading coefficients (≥ 0.82) and its data variation is well-explained ($\geq 78\%$). Therefore, the measurements are acceptable for CFA (Byrne, 2010).

A CFA is performed for 11 first-order factors with 43 observed variables to examine the model-data fit. Empirical results are shown as follows: $\chi^2/\text{df} = 2.301$, comparative fit index (CFI) = 0.915, Tukey and Lewis index (TLI) = 0.904 and root mean square error approximation (RMSEA) = 0.052 ($p = 0.000$), so the measurement model is compatible with the data (McDonald and Ho, 2002). Next, the validity of convergence is achievable because all factor loadings are greater than 0.5 (Table 4) and significant t -statistics (Anderson and Gerbing, 1991). Moreover, the average variance extracted (AVE) values (Table 4) are between 0.519 and 0.788, which are greater than both 0.5 and squares of their correlation coefficients (Table 5), respectively, then each construct is a distinct construct and discriminant validity is acceptable (Fornell and Larcker, 1981). Therefore, CFA results confirm that 43 observed variables are extracted into 11 first-order constructs, as well as the measurements are model-data fit, discriminant validity, uni-dimensionality, convergence validity and internal consistency reliability.

Table 5.
Correlation
coefficients matrix

	TIR	PU	PRI	SEC	EOU	SOR	IU	FIR	SI	PER	PSR
TIR	0.786										
PU	-0.040	0.719									
PRI	0.341	0.007	0.873								
SEC	0.192	-0.084	0.224	0.853							
EOU	-0.054	0.479	0.115	-0.041	0.777						
SOR	0.273	-0.157	0.066	0.131	-0.173	0.839					
IU	-0.262	0.478	-0.294	-0.199	0.295	-0.351	0.888				
FIR	0.334	-0.056	0.409	0.132	0.049	0.188	-0.345	0.774			
SI	-0.059	0.350	-0.148	-0.163	0.324	-0.135	0.348	-0.054	0.770		
PER	0.282	-0.154	0.382	0.300	0.003	0.158	-0.406	0.320	-0.148	0.723	
PSR	0.428	-0.100	0.402	0.271	-0.085	0.344	-0.396	0.461	-0.110	0.427	0.725

Due to the existing of second-order factor in the proposed model, the next CFA is needed to estimate the relative of seven first-order risk dimensions, including financial, performance, psychological, social, time, security and privacy risk, with the second-order reflective perceived risk on the measurement model. The results are shown as follows: $\chi^2/df = 2.343$, CFI = 0.91, TLI = 0.904 and RMSEA = 0.053 ($p = 0.000$), so the model fit the data very well (McDonald and Ho, 2002). Thus, hypothesis *H2* is supported.

4.3 Structural equation modeling

A structural equation model (SEM) is conducted to test the proposed model with 3 independent constructs (social influence, perceived ease of use and perceived risk) and 2 dependent constructs (perceived usefulness and intention to use credit cards), which are measured by 43 observed variables as mentioned in above factor analyzes. Figure 2 shows the whole SEM for the proposed model. All indicators ($\chi^2/df = 2.340$, CFI = 0.910, TLI = 0.904 and RMSEA = 0.053) show that the proposed model is appropriate for data collected from the market (McDonald and Ho, 2002). The result of SEM is described in Table 6. Whereby, perceived usefulness, perceived risk, social influence and perceived ease of use accounted 50.1% of the variance in intention to use credit cards with coefficients of 0.320, -0.539 , 0.141 and 0.089 , respectively. Moreover, perceived risk, social influence and perceived ease of use are determinants of perceived usefulness on credit cards. Finally, perceived risk on credit cards is a multi-dimensional construct, which is synthesized from psychological, financial, performance, privacy, time, social and security risk in decreased contribution, respectively. Therefore, all hypotheses are accepted.

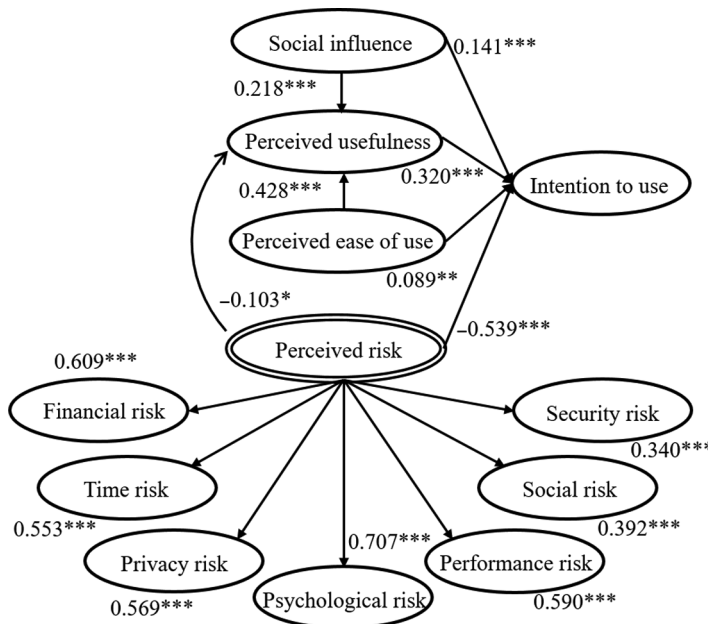


Figure 2.
Proposed research
model and the result
of SEM

Table 6.
Results of the
structural equation
model

Hypothesis	Relationship	Estimate	S.E.	CR	P.	Result
H1	PU → IU	0.320	0.048	6.359	***	Accepted
H2a	FIR ← PR	0.609				Accepted
H2b	PER ← PR	0.590	0.126	7.360	***	Accepted
H2c	PSR ← PR	0.707	0.145	7.414	***	Accepted
H2d	SOR ← PR	0.392	0.141	7.698	***	Accepted
H2e	TIR ← PR	0.553	0.112	5.979	***	Accepted
H2f	SER ← PR	0.340	0.125	5.478	***	Accepted
H2g	PRR ← PR	0.569	0.152	7.838	***	Accepted
H3	PR → PU	−0.103	0.071	−1.951	0.051	Accepted
H4	PR → IU	−0.539	0.087	−7.934	***	Accepted
H5	EOU → PU	0.428	0.047	8.080	***	Accepted
H6	EOU → IU	0.089	0.038	1.987	0.047	Accepted
H7	SI → PU	0.218	0.047	4.434	***	Accepted
H8	SI → IU	0.141	0.038	3.327	***	Accepted

5. Discussion

The purpose of this study was to examine the effect of perceived risk on the intended use of credit cards. By integrating popular technology adoption theories, the study assessed the relationships among three exogenous variables (perceived risk, perceived ease of use and social influence) and two endogenous variables (perceived usefulness and behavioral intention). Table 6 and Figure 2 present the results of hypothesis testing for the research model including the path coefficients and their significant values.

First, perceived risk was considered as consumer's subjective expectations for incident losses relevant to credit card use, which was compared with previous research studies (Nguyen and Cassidy, 2018; Tan *et al.*, 2014; Tseng, 2016; Varaprasad *et al.*, 2013). The CFA results indicated that perceived risk was a second-order reflective construct related with seven first-order risk dimensions, including financial, performance, psychological, social, time, security and privacy risk. With this finding, the study became very different from prior studies, where perceived risk was conceptualized as one-dimensional construct (Nguyen and Cassidy, 2018; Tan *et al.*, 2014; Varaprasad *et al.*, 2013) or two one-dimensional constructs (Tseng, 2016). The SEM analysis illustrated that psychological risk (PSR) dimension had the strongest related with the perceived risk, followed by financial risk (FIR), performance risk (PER), privacy risk (PRR), time risk (TIR), social risk (SOR) and security risk (SER).

Subsequently, perceived risk was found to have a negative effect on the intended use with the largest level of impact ($\beta = -0.539$), which was almost equal to the total of impact level from three remaining factors in the model. This finding had contributed to the TPR (Bauer, 1960) by insisting the negative impact of perceived risk in behavioral research on credit cards, which Tan *et al.* (2014), Tseng (2016) and Varaprasad *et al.* (2013) could not. Furthermore, this result was better than those of previous studies (Nguyen and Cassidy, 2018) with its impact level of -0.18 . The results insisted the significant relationship between perceived risk and perceived usefulness, which Nguyen and Cassidy (2018), Tan *et al.* (2014) and Varaprasad *et al.* (2013) did not mention or Tseng (2016) failed to prove. These findings made the present study different from previous works.

Finally, the SEM analysis confirmed the relationships among perceived usefulness, perceived ease of use, social influence and behavioral intention. The findings showed that perceived ease of use and social influence have positive impact on both perceived usefulness

($\beta_{\text{EOU}} = 0.428$, $\beta_{\text{SI}} = 0.218$) and the intended use ($\beta_{\text{EOU}} = 0.089$, $\beta_{\text{SI}} = 0.141$). In turn, perceived usefulness also affected on the intention to use. Thus, this study demonstrated all hypotheses related to perceived usefulness, perceived ease of use, social influence. These findings were consistent with prior studies (Leong *et al.*, 2013; Nguyen and Cassidy, 2018; Tan *et al.*, 2014).

6. Conclusions

This study is a pioneering effort in context of credit card adoption by proposing a theoretical model to determine factors affecting consumer intention to use credit cards, including perceived risk from TPR (Bauer, 1960), perceived usefulness, perceived ease of use and social influence from TRA, TAM, TPB and UTAUT. Based on collected data from 485 bank customers, this study reveals that perceived risk is a reflective second-order factor related to seven first-order risk dimensions – psychological, financial, performance, privacy, time, social and security risk. The results show that the intended use of credit cards is affected by perceived risk, followed by perceived usefulness, social influence and perceived ease of use in decreased ranking. All these factors encourage consumer to use credit cards, except perceived risk. Moreover, perceived risk, perceived ease of use and social influence are antecedents of perceived usefulness on credit cards.

This study has both theoretical and practical contributions. The first theoretical contribution of this work was to conceptualize perceived risk as a reflective second-order construct, that was modeled and decomposed into the seven first-order risk dimensions, including psychological, financial, performance, privacy, time, social and security risk. Second, the research contributed to the literature on consumer behavior by confirming the impact of perceived risk on the intended use of credit cards, which most previous studies have not demonstrated. Finally, the research findings provided an empirical evidence as theoretical contribution to the academic research platform on e-banking services in Vietnam, especially related to the credit card industry.

This study can be beneficial to banks enacting policies to attract more consumers and to help decide how to allocate resources to retain and expand their customer base. Based on factors influencing consumer intended use of credit cards, banks may encourage them to own and use credit cards for paying goods and services. As the findings imply, banks should focus their resources on overcoming the risk aspects, which can help motivating potential consumers. Banks should advertise that credit card is not a risky service by providing positive reviews at point of sales or in mass media. The publicity of loss protection policies and service-level agreements may reduce potential losses of performance or finance. Additional effective risk preventing policies may include money back guarantees, so that consumers feel more comfortable and safe with the system. Other whence, the positive impact of perceived usefulness, perceived ease of use and social influence on credit card acceptance can be exploited by banks in framing or refining the transactional procedures or relevant services. In the constantly changing business world, banks and related stakeholders should add more useful features and services to credit cards and they should simplify the procedures in making payment via credit cards. Therefore, they will be ready to accept the offers made by credit card issuers and encourage others to use credit cards.

Although this study provided substantive explanations for perceived risk and its effect on consumer intention to use credit cards, it still has several limitations. First, the first-order risk dimensions were measured based on the payment function of the credit card only; these measurements missed potential losses relevant to credit function of credit cards. Second, the present study focused on perceived risk and other factors as the antecedents of the intention

to use credit cards while these relationships might be moderated by age, gender, experience, etc. Finally, the empirical data are collected randomly from only Vietnamese bank customers; this limited data may mislead to the accuracy and explain the ability of the proposed theoretical model. Thereby, future studies may perform a multi-national survey on both payment and credit functions of credit cards, as well as integrating reasonable moderators into the proposed model to address these shortcomings.

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