Credit Card Adoption in Vietnam: A Perspective of the Stimulus Organism Response Model

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This study aims to develop a theoretical model in order to determine perceived risk, their antecedents and consequences in credit card adoption. Using the Stimulus Organism Response model, the study proposes relationships between information system quality, perceived risk, and the intended use of credit cards. However, despite prior studies on consumer behaviour, this study introduces three components of perceived risk in source, including transaction risk, payment risk and credit risk. Therefore, preliminary research is helpful to describe and measure the research constructs in the proposed model. With data collected from 538 bank customers, this study conducts the structural equation model to test the research model and proposed hypotheses. The results analysis shows that information quality, system quality, and service quality have negative effects on transaction risk, payment risk, and credit risk. Meanwhile, three components of perceived risk in source are the significant inhibitors of the intended use of credit cards. These risk perceptions account for 46.8% of the variation in intended use. The findings provide bank managers solutions to achieve a high-quality information system, which may reduce consumer apprehension about potential losses and then encourage their intended use of credit cards.

Key words: *Credit Card, SOR, Behavioral Intention, Vietnam*

JEL Classification Code: D12, D14, E42, G21

1. Introduction

In increased fierce competition in the banking sector, Vietnamese banks have constantly deployed many modern banking services, such as foreign exchange trading, factoring, and financial derivatives. Besides, banks actively apply scientific and technological achievements, especially information technology, communication networks and internet into banking activities. Banks also focus on connecting electronic payment gateways, expanding the network of merchants accepting credit cards, which differ from other types of non-cash payment means in the function of consumer loans (Foscht, Maloles, Swoboda, & Chia, 2010).

At the end-of-year 2020, the Vietnamese credit card market records about 4.9 million cards in circulation, an increase of about a million cards compared to one year ago (State Bank of Vietnam, 2020). However, with a workforce of nearly 60 million people, the credit card ownership rate is up 0.08 cards/person, which is lower than both that of Southeast Asia (0.22 cards/person) and the world (0.81 cards/person). Besides, banks issue credit cards for only 2.65 million workers in total 46 million bank users and about 15.8 million households are in a need of consumer loans (General Statistics Office of Vietnam, 2020). As reported by the State Bank of Vietnam (2020), in the last few years, more and more customers liquidate their credit card contracts early, while others do not respond or immediately refuse opening requests from credit card issuers, which has never happened before. Thus, banks are facing major challenges in their credit card business, and studying consumer behaviour towards credit cards is more urgent than ever.

The literature review on credit cards confirms the consistent effects of perceived usefulness, perceived ease of use on intended use of credit cards as Davis, Bagozzi, and Warshaw's (1989) recommendations in the popular technology acceptance model TAM. Consumers are rational, so they intend to pay bills by credit cards when they appreciate the performance achieved from that payment (Nguyen & Cassidy, 2018; Ooi & Tan, 2016; Tseng, 2016), and when they find the payment is easy (Jamshidi & Hussin, 2016; Kemal & Ugur, 2017). Besides, consumers are conservative, they consider profits and losses in deciding, so perceived risk is an inhibitor of the intended use of credit cards (Trinh, Tran, & Vuong, 2020; Wang & Lin, 2019). The question of how to overcome the worry of potential losses in credit card use still has no satisfactory answer.

Risk perceptions are personal cognitive states, which are changed by some environmental stimulants, and then cause a behavioural response. Mehrabian and Russell (1974) describe these relationships in Stimulus Organism Response SOR. Many studies show that the SOR is suitable for understanding the intended use of electronic financial services (Hsu, Chang, & Chen, 2012; Kim & Lennon, 2013; Li & Yuan, 2018). These studies also confirm that information system quality is an important environmental stimulant affecting an individual's cognitive state, which then influence their reactive actions. Among many recommendations of an information system's quality, DeLone and McLean (2003) define the famous three-

component-quality of e-commerce systems, including information, system and service quality. These components of information system's quality are proposed in many empirical studies on e-service adoption (Hossain & Zhou, 2018; Lee & Kim, 2017)

An approach of information system quality, perceived risk and intended use 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 behaviour. As a result, the study develops a research model and proposed hypotheses, followed by the research method and data collected. The findings are detailed and discussed, before concluding, and proposing future research directions.

2. Literature Review

Consumer behaviour is the dynamic interaction of influencing factors, perceptions, behaviour and environment, which make consumers change their own lives (Solomon, 1996). Kotler and Keller (2008) argue that research on consumer behaviour is about understanding how individuals and organisations perform choosing, buying, using and rejecting products / services. However, this research field is not only about understanding consumer actual behaviour but also the intended use of products / services. Most times, the intention to use is considered as the determination of behaviour and is a reasonable representation of actual consumer behaviour. Once consumers intend to use the product / service, they are ready to perform a particular behaviour (Davis et al., 1989).

Consumers accept or reject a behaviour based on their subjective perceptions, which are changeable because of the impact of the surrounding environment. Mehrabian and Russell (1974) present such an idea in the SOR related to environmental psychology. The core value of the SOR is that when an individual is exposed to a stimulus from the environment (S), they develop cognitive states (O) as an impetus / inhibitor of their accept or reject behaviour (R). Jacoby (2002) confirms that the SOR is suitable to research on consumer behaviour because of its flexibility. Many empirical evidences show that the SOR is a useful theoretical framework for understanding individual behaviour towards electronic financial services. For example, Li and Yuan (2018) define the intermediary role of perceived risk in the relationship between factors related to suppliers and consumers' intended use of online group purchase. Hsu et al. (2012), Kim and Lennon (2013) apply the SOR to determine the impact of website quality on perceptions about flow and enjoyment, and then their online shopping intention. This approach is also applied by Hossain and Zhou (2018), who confirm the characteristics of the mobile payment system are the stimulus for satisfaction and intention to use through a sense of transaction flow. Although there are some differences, the aforementioned studies share views on environmental stimulus of information systems in the adoption of electronic services served by those systems.

In information technology, increasingly developing modern information systems are developed and involved in all aspects of life such as health, education, commerce, etc. The emergence of

information systems motivates people to change their behaviour from offline to online. Faced with many choices, the perception of quality about a particular system is an important factor for consumers' decisions. As a result, DeLone and McLean (2003) introduce a comprehensive theoretical framework focusing on the quality of an e-commerce system with three components, including information quality, system quality and service quality. These quality components are environmental stimulants in empirical studies on e-service adoption (Hsu et al., 2012; Lee & Kim, 2017; Sharma & Sharma, 2019b).

Credit cards are available on e-devices with two basic functions: payment and credit (Foscht et al., 2010). With the advantage of buy first-pay later, credit cards have become one of the most popular payment instruments in the world (Laudon & Traver, 2019). Therefore, many researchers have carried out and published their papers in prestigious journals around the world. These studies integrate the TAM (Davis et al., 1989) with theory of perceived risk TPR (Bauer, 1960) to predict consumer intention to use credit cards. For example, Ooi and Tan (2016) show the cognitive structures of trust, compatibility, and usefulness have a significant and positive effect on consumer intended use of mobile credit cards; this study rejects the role of perceived ease of use, security risk, and financial risk. Kemal and Ugur (2017) find Turkish consumers refer to use credit cards when they appreciate the usefulness and the ease of use of this payment instrument, however there is no evidence about the impact of perceived risk, perceived playfulness on credit card adoption. Nguyen and Cassidy (2018) investigate the key elements that influence an individual's intention of adopting credit cards in the transitional economy of Vietnam by modifying the parsimonious TAM; the analyses show that perceived usefulness, perceived ease of use, subjective norms, perceived self-efficacy, and anxiety significantly affect the intended use of credit cards. Meanwhile, Phan, Nguyen, and Bui (2019) reveal that subjective norm, perceived usefulness, attitude, perceived behavioural control and perceived experience have a positive impact, opposite, perceived risk has a negative and significant effect on consumer intended use of credit cards. Wang and Lin (2019) propose usefulness, ease of use, perceived risk, and 5 other constructs to analyse consumer decisions to pay using contactless credit cards. Their analysis results confirm only compatibility and perceived risk are important determinants of consumers' use intention to pay by contactless credit cards. Similarly, Trinh et al. (2020) show that perceived risk, perceived usefulness, social influence and perceived ease of use are significant determinants of consumer intention to use a credit card; of them, only perceived risk discourages the intended use of a credit card, which is synthesised from psychological, financial, performance, privacy, time, social and security risk.

In summary, the literature review of credit card adoption shows that consumers are more likely to use credit cards when they are more interested in their usefulness, ease of use and disregard related losses. 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. These negative cognitive perceptions may be reduced by the high quality of information systems,

which suppose the use of credit cards. An approach of information system quality, perceived risk and intended use is a fresh issue in the research framework for credit card industry.

3. Research Model Development

The literature review on credit card adoption shows that three cognitive states of perceived usefulness, perceived ease of use, and perceived risk have a significant effect on intention to use. Among them, perceived risk is the only inhibitor of intended use of credit cards, which is consistent with many studies on e-services (Li & Yuan, 2018; Yang, Liu, Li, & Yu, 2015). Credit cards are a kind of technology product issued by banks and are only available on particular information systems designated by banks. As a result, individuals' judgment of using credit cards depends on how they judge the quality delivered by the system that response to the use of credit cards (DeLone & McLean, 2003). In this study, perceived quality of electronic banking information systems is an important antecedent of perceived risk of using credit cards.

The aforementioned relationship between the quality of the information system, perceived risk of using credit cards, and the intended use of credit cards is consistent with the SOR (Mehrabian & Russell, 1974). In which, the perceived quality of information systems plays the role of environmental stimulant (*Stimulus*), the perceived risk is cognitive state (*Organism*) and the intended use is reactive behaviour (*Response*). The SOR is a suitable choice for this study because it provides a reasonable theoretical justification for using perceived quality as an affecting factor from the environment (Hsu et al., 2012; Li & Yuan, 2018). This model allows analysis of the impact of each individuals' cognitive states on their intended behaviours (Ozturk, 2016). Finally, it allows an approach of behavioural intention as a response to cognitive states resulting from exposure to environmental stimuli (Yang et al., 2015). Figure 1 shows the relationships between perceived risk, its antecedent and consequence.
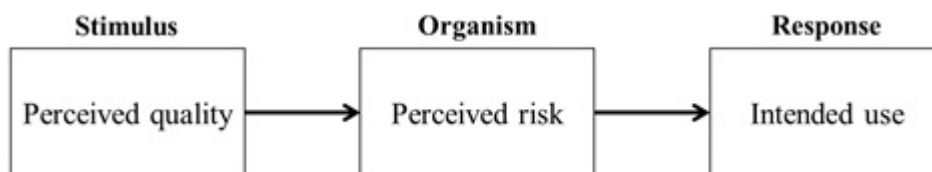
Figure 1: Theoretical model

The advent and continuous development of information systems provides consumers with many choices in all aspects of human life. The selection of a certain system depends on the perceived quality or the level of assessment of its excellence or superiority (Zeithaml, 1988). There are many quality measurement models for specific information systems (DeLone & McLean, 2003; Wolfinbarger & Gilly, 2003). Among them, the most popular is the quality scale of DeLone and McLean (2003) on e-commerce information systems, with information, system, and service quality. Many empirical studies have used DeLone and McLean (2003)'s

quality scale in a variety of research fields (Kim & Lennon, 2013; Li & Yuan, 2018; Yang et al., 2015). The three quality components of information systems are described below:

Information quality (INQ) is the quality of results provided by the information system and expressed through accuracy, timeliness and reliability (DeLone & McLean, 2003). In credit cards, perceived information quality is the level of consumer confidence in the accuracy and completeness of information widely disclosed by banks about credit cards and related services. One of the most popular and effective communication channels in use today is the Internet (Laudon & Traver, 2019). However, information on the Internet is constantly changing, and it is difficult to verify their quality. Many empirical studies confirm the information quality as one of the most important inhibitors to perceived risk (Li & Yuan, 2018; Sharma & Sharma, 2019b). High-quality information can be useful in acquiring knowledge, enhancing individuals' ability to handle information (Sharma & Sharma, 2019b), then help them overcome anxiety about unexpected outcomes when performing the behaviour (Hsu et al., 2012; Li & Yuan, 2018). Similarly, issuing banks with their ability to provide high-quality information about credit cards and related services can increase the certainty in consumers' thought and help them be less apprehensive about credit cards when using them in everyday consumer payments.

System quality (SYQ) measures the desirable characteristics of information systems such as availability, adaptability, response time, reliability (DeLone & McLean, 2003). For credit card payments, the most important thing for consumers is that they can pay and pay bills successfully with the correct amount with the right service fees. Therefore, this study considers consumers' perception of system quality as the degree of their confidence in the system's ability to successfully and accurately respond to credit card payments raising no issues related to information security and privacy (Wolfinbarger & Gilly, 2003). Empirical evidences shows that system quality is an important antecedent of perceived risk. The continuous, accurate, efficient operation of information systems helps consumers overcome anxiety about potential losses when using the systems (Hsu et al., 2012; Yang et al., 2015). When consumers appreciate a supplier's ability to ensure a successful transaction as expected, it is easier for them to overcome their apprehension about likely damages to complete transactions (Gurung & Raja, 2016; Kim & Lennon, 2013). Thus, they may feel less at risk when using credit cards for everyday payments.

Service quality (SEQ) of an information system is the quality of the overall support that the consumer receives from the supplier (DeLone & McLean, 2003). This support makes sense for users in helping them navigate through confusing technical jargon, complex processes, and problems that arise (Kim & Lennon, 2013). Enterprises with high-quality services create a competitive advantage in the market by attracting new customers and keeping existing ones (Ghotbabadi, Feiz, & Baharun, 2016). In this study, the service quality of credit cards represents the extent to which consumers rate support from banks during the use of credit cards (Hsu et al., 2012). Many empirical studies reveal the impact of service quality on perceived

risk. Kim and Lennon (2013) confirm the influence of service quality on consumers' perception of potential harms when purchasing online. Meanwhile, Ghotbabadi et al. (2016) show that consumers perceive high quality service from banks when their questions, complaints or problems are received, clarified or quickly resolved with respect, sharing and sympathy. Therefore, an increase in service quality of the information system may reduce potential credit card-related losses.

Perceived risk represents consumers' subjective expectations of the damage that can occur when performing specific behaviours (Bauer, 1960). Frambach (1993) showed that accepting a behaviour depends on how one feels about the losses caused by that behaviour. Credit card is a technology product in consumer lending, and debt arises only when the card is used on electronic devices to pay bills or advance cash (Foscht et al., 2010). Therefore, this study defines the perceived risk of credit cards as the consumer's assessment of the potential loss of using them in daily consumer payments. Based on the payment function of credit cards in electronic devices, this study proposes two facets of perceived risk in sources as suggested by Park, Lee, and Ahn (2004), Herrero and Martin (2012), including perceived transactional risk and perceived payment risk. Besides, the lending function of credit cards facilitates and encourages consumers to purchase, as a result, they easily fall into debt and may be insolvent (Jirotmentree, 2010). Therefore, this study introduces credit risk as the third component of perceived risk in source relevant to credit card use. The three risk components of credit card use are described below:

For registering credit cards, consumers need to provide personal information, including demographics, occupation, and income. Issuing banks will store this information digitally with all credit card transaction history in customer profile. During credit card transactions, banks send and receive customer records to merchants and online payment service providers (Foscht et al., 2010). However, this sending and receiving process is potentially dangerous in an electronic environment (Featherman, Miyazaki, & Sprott, 2010). Inheriting the results of Park et al. (2004), this study proposed perceived e-transactional risk (PTR) as a component of perceived risk in source; it shows the consumer assessment of the potential losses caused by using credit cards on electronic devices. Empirical evidences confirm the determinant of perceived e-transactional risk on intended use of e-services. In a pioneering study on the acceptance of e-services, Herrero and Martin (2012), Park et al. (2004) argue that consumers care and value potential damages when using services on e-devices. Similarly, Gurung and Raja (2016) highlight the negative influence of perceived risk on the intention to perform electronic transactions.

With a credit card, the consumer (the buyer) can pay for purchases on point of sale devices or in online payment portals (Foscht et al., 2010). However, the buyer cannot take banknotes from banks and then pay them back to the seller as a traditional method. Instead, the buyer's account immediately recognises a liability for the amount showed on the invoice, which is transferred

to the seller's account (Laudon & Traver, 2019). Therefore, the payment is successful when the buyer has paid the correct amount for the purchase at no additional cost. However, paying bills by credit card is not always easy, convenient, fast or supported by all people (Nguyen & Cassidy, 2018; Trinh et al., 2020). Based on the suggestions of Herrero and Martin (2012), Park et al. (2004) for perceived risk of products/services and the payment function of credit cards, this study proposes the perceived payment risk PPR is one component of perceived risk in source; it describes how consumers evaluate the potential losses related to bill payments with credit cards. Many empirical studies pointed out that perceived risk is a decisive factor for the adoption of payments in e-devices (Ozturk, 2016; Yang et al., 2015).

Based on credit line, cardholders can pay bills that are worthier than their regular earnings. This line may not meet the spending needs of some individuals, but is a challenge for shopaholics with excessively high charges and interest rates. Regardless of the reason, cardholders, who make late payments, cannot pay the minimum amount, or do not pay at all, become overdue debtors. When an individual has many loans at banks, as long as one of them is in overdue status, all the remaining loans will automatically switch to the same status (Foscht et al., 2010). As a result, banks conduct debt collection using personal, family, local or workplace channels. Banks also delay or cancel overdue debtor's credit contracts that are even in the process of verification or disbursement. The aforementioned issues are potential risks arising from loaning with credit cards. The evidence points to perceived credit risk for perceived usefulness, perceived ease of use and intention to use (Jirotmentree, 2010).

Hence, this study examines credit cards in the perspective of the SOR with three quality components of information systems as environmental stimulants, three risk components as cognitive states, and the intended use of credit cards as a reactive behavior. The investigation is based on the following hypotheses:

> **H1:** *Information quality has negative effect on perceived transaction risk*
> **H2:** *Information quality has negative effect on perceived payment risk*
> **H3:** *Information quality has negative effect on perceived credit risk*
> **H4:** *System quality has negative effect on perceived transaction risk*
> **H5:** *System quality has negative effect on perceived payment risk*
> **H6:** *System quality has negative effect on perceived credit risk*
> **H7:** *Service quality has negative effect on perceived transaction risk*
> **H8:** *Service quality has negative effect on perceived payment risk*
> **H9:** *Service quality has negative effect on perceived credit risk*
> **H10:** *Perceived transaction risk has negative effects on intention to use*
> **H11:** *Perceived payment risk has negative effects on intention to use*
> **H12:** *Perceived credit risk has negative effects on intention to use*

4. Methodology

This study uses a quantitative method to test the proposed model and research hypotheses (Figure 2). However, the mediating role of perceived risk in source on the relationship between the multi dimensions of quality and the intended use under the SOR approach is a fresh approach in the credit card industry. Thus, the study conducts the preliminary research with a participation of two groups of 5 bankers and 5 cardholders. They discuss and provide scales for each of research concepts. Their recommendation is a measurement of 52 observed variables for 7 constructs, which is assessed in a pilot test with 224 bank users. The results showed that 35 observed variables are satisfactory and available for the formal research.
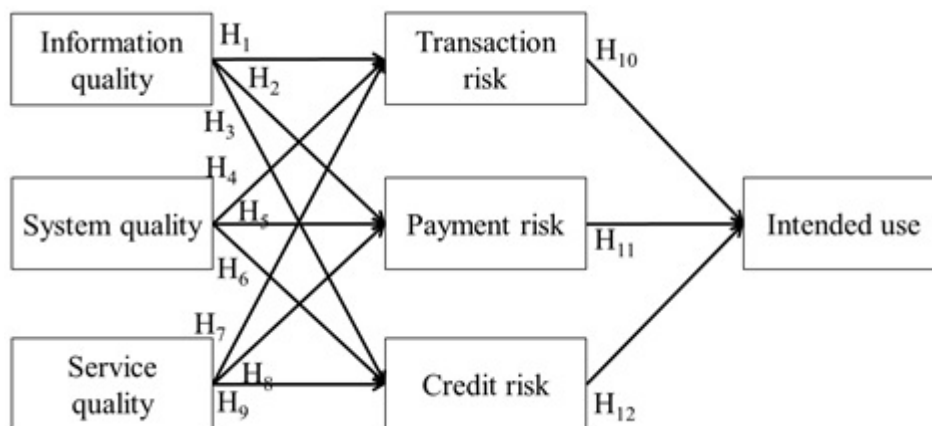
Figure 2: Proposed research model

The formal research uses data collected from self-administered questionnaires based on the aforementioned measurement of 35 observed variables in a five-point Likert multivariable scale (1-strongly disagree and 5-strongly agree). In total 734 bank customers took part in the online survey. Among them, 538 responses are valid and usable, yielding a valid response rate of 73.3 percent. 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.

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	122	22.7	Industries	118	21.9
500-900	260	48.3	Trading services	145	27.0
900-1.600	154	28.6	Financial services	119	22.1
1.600-2.600	2	0.4	Public services	138	25.7
Above 2.600	0	0	Others	18	3.3

Based on the data collected, this study conducts Cronbach's alpha analysis to verify a reliability of observed variables and their contribution to latent constructs in the proposed model. Reliable variables are appropriate for exploratory factor analysis EFA, which clarifies underlying relationships between observed variables and identifies the minimum number of factors. A confirmatory factor analysis CFA investigates the link between these factors and their measured variables. With a set of hypotheses on complex, flexible relationships between factors extracted from observed variables, a structural equation model SEM is extremely suitable statistic instrument (Hair et al., 2014).

5. Results

5.1. Cronbach's Alpha Analysis

An internal consistency reliability of the items is determined by Cronbach's alpha analysis. The results show that the scale of 7 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 SYQ5 from system quality and PCR5 from credit risk. These variables should be removed from the study (Hair et al., 2014). The second Cronbach's alpha analysis is conducted for system quality and credit risk, respectively, in which reliability coefficients exceed 0.6 and all corrected item-total correlation values are greater than 0.3. Therefore, 33 remain observed variables are eligible to factor analyses (Hair et al., 2014). Table 2 presents the summarised Cronbach's alpha analysis.

Table 2: Reliability and Factor analysis

Latent constructs		Correlated item-total	EFA loading coefficients	CFA loading coefficients
Intention to use credit card IU (Nguyen & Cassidy, 2018) Cronbach's α=0.888, Eigenvalues=3.005, AVE= 0.670, C.R.=0.89				
IU1	Will think about using credit cards	.749	.810	.802
IU2	May use credit cards in near future	.736	.792	.794
IU3	Intend to use as soon as the opportunity	.803	.873	.873
IU4	Willing to use credit cards in the near future	.739	.795	.802
Information quality INQ (Tseng, 2016) Cronbach's α=0.898, Eigenvalues=2.764, AVE=0.696, C.R.=0.902				
INQ1	Provides up-to-date information	.825	.882	.883
INQ2	Provides timely information	.752	.790	.822
INQ3	Provides accurate information	.789	.835	.831
INQ4	Provides complete information	.743	.820	.8
System quality SYQ (Tseng, 2016) Cronbach's α=0.845, Eigenvalues=1.547, AVE=0.585, C.R.=0.847				
SYQ1	Well-designed system	.608	.741	.69
SYQ2	Well-navigated system	.571	.641	.61
SYQ3	Well-secured system	.644	.778	.832
SYQ4	Well-managed system	.680	.882	.894
SYQ5	Continuously upgraded system	.032		
Service quality SEQ (Tseng, 2016) Cronbach's α=0.908, Eigenvalues=6.857, AVE=0.714, C.R.=0.909				
SEQ1	Helps me when I need support	.753	.777	.799
SEQ2	Quick response to my complaint	.802	.847	.858
SEQ3	Understand and meet my needs	.787	.812	.841
SEQ4	Provide the service as promised	.828	.926	.879
Perceived transaction risk PTR (Park et al., 2004) Cronbach's α=0.744, Eigenvalues=2.019, AVE=0.615, C.R.=0.865				
PTR1	Loss of money due to erroneous entry	.345		
PTR2	Loss of personal information	.721	.800	.8
PTR3	Bothered by unknown people	.663	.793	.779
PTR4	Stress due to loss in online payment	.310		
PTR5	Loss security	.624	.808	.794
PTR6	Attacked by cybercrimes	.603	.736	.763
Perceived payment risk PPR (Park et al., 2004) Cronbach's α=0.817, Eigenvalues=2.539, AVE=0.699, C.R.=0.903				
PPR1	Loss of much money to use credit card	.703	.783	.804

PPR2	Cannot pay with credit card	.747	.810	.822
PPR3	Anxious with failed payments	.764	.863	.847
PPR4	Underrated by family and friends	.416		
PPR5	Get laughed at for mistakes or cheating	.411		
PPR6	Loss of much time to resolve complaints	.731	.884	.869
Perceived credit risk PCR (new construct) Cronbach's α=0.815, Eigenvalues=2.399, AVE=0.709, C.R.=0.906				
PCR1	Pay high interest on credit card debt	.813	.955	.959
PCR2	Pay interest on fraudulent transactions	.763	.805	.788
PCR3	issatisfaction because of low credit limit	.344		
PCR4	Cannot pay debt fully and on time	.656	.765	.771
PCR5	Loss of control of spending			
PCR6	Despised for debt and inability to repay	.678	.814	.789

5.2. Factor Analysis

The first EFA extracts 6 factors from 29 observed variables; almost loading factors are greater than 0.5, excepted PPR4, PPR5, PCR3, PTR1 and PTR4. These variables should be removed from the study. The second EFA examines 24 remain observed variables, which extracts 6 factors with total extracted variance of variables is 67.598%, the KMO coefficient is 0.846 (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 (≥0.792) and explain well its data variation (≥82%). Therefore, the measurements were acceptable for CFA (Hair et al., 2014).

Next, the study conducts the CFA for the proposed model with 7 factors and 28 observed variables to examine the model-data fit. The values of Chi-square/df=2.288, GFI=0.14, CFI=0.957, TLI=0.950 and RMSEA=0.049 show that the suggested model is appropriate (McDonald & Ho, 2002). Next, the validity of convergence is achievable because all factor loadings are greater than 0.5 (Table 2) and significant t-statistics (Anderson & Gerbing, 1991). 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 (Fornell & Larcker, 1981). The composite reliability (CR) values of all latent constructs are greater than 0.6 (Hair et al., 2014). Therefore, CFA extracts 28 observed variables into 7 constructs, which are model-data fit, discriminant validity, uni-dimensionality, convergence validity and internal consistency reliability.

5.3. Structural Equation Modeling

The study performs the SEM to test the proposed research model and its research hypotheses. Figure 3 shows the whole SEM for the proposed model. The values of Chi-square/df=1.794,

GFI=0.928, CFI=0.973, TLI=0.969 and RMSEA=0.038 show that the proposed model is appropriate for data collected from the market (McDonald & Ho, 2002). All relationships in the model are available (Table 3). Therefore, all hypotheses are accepted.

Table 3: Results of the structural equation model

Hypothesis	Relationship			Estimate	S.E.	C.R.	P.	Result
H1	INQ	--->	PTR	-0.092	0.052	-1.911	0.056	Accepted
H2	INQ	--->	PPR	-0.196	0.057	-4.112	***	Accepted
H3	INQ	--->	PCR	-0.288	0.038	-7.004	***	Accepted
H4	SYQ	--->	PTR	-0.119	0.058	-2.502	0.012	Accepted
H5	SYQ	--->	PPR	-0.11	0.062	-2.365	0.018	Accepted
H6	SYQ	--->	PCR	-0.298	0.042	-7.247	***	Accepted
H7	SEQ	--->	PTR	-0.281	0.058	-5.49	***	Accepted
H8	SEQ	--->	PPR	-0.171	0.062	-3.45	***	Accepted
H9	SEQ	--->	PCR	-0.263	0.041	-6.239	***	Accepted
H10	PTR	--->	IU	-0.365	0.031	-8.493	***	Accepted
H11	PPR	--->	IU	-0.387	0.028	-9.274	***	Accepted
H12	PCR	--->	IU	-0.266	0.034	-6.737	***	Accepted

6. Discussion

This study has 12 hypotheses about causal relationships among latent factors in the research model. These hypotheses are tested using the SEM analysis, which are described below:
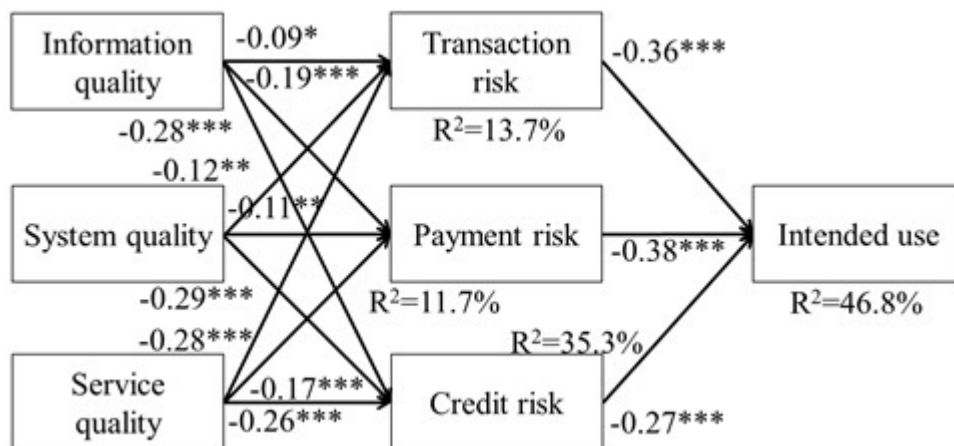
Figure 3: Proposed research model and the results of SEM

The study confirms a measurement for perceived information quality of credit card information systems. Consumers evaluate suppliers' honesty in disclosing up-to-date, accurate, timely and complete information about products and services. The results of SEM analysis show that information quality has a negative significant effect on all three components of perceived risk

in source (H1, H2, H3 are accepted), which is consistent with prior studies of Li and Yuan (2018), Yang et al. (2015). When consumers are available for high-quality information about credit cards, they can increase their understanding of privacy and security in their use in e-devices. They also can understand the payment process, the meaning of messages displayed, and the reason for unsuccessful transactions. With high-quality information, consumers are aware of the debt's consequences, proactive in controlling debts, and perform repayment in full and on time. As a result, consumers underestimate the potential losses associated with paying bills by credit card on electronic devices.

The next component of quality mentioned in this study is system quality or a system with friendly design, easy navigation, security and good management. The SEM results reveal that system quality has a negative impact on transaction risk, payment risk, and credit risk (H4, H5, H6 are accepted). When consumers appreciate the system quality of credit card payment systems, they ensure these systems can protect them from threats of information insecurity and invasion of privacy. They also have confidence in paying bills with the correct amount, along with committed fees (Ghotbabadi et al., 2016). Meanwhile, the system in high quality not only helps consumers getting loans, repaying debt easily but also detects and prevents fraudulent transactions promptly (Yang et al., 2015). A good credit card system also allows consumers tracking their debts and choose the repayment method. With such a high-quality system, consumers are likely to ignore the potential losses raised in using credit cards.

The study proposes service quality as issuing banks' ability to provide good services, timely and effective supports whenever consumers encounter trouble or have an urgent issue to be solved. The SEM results reveal that when consumers appreciate the credit card system's service quality, they are less likely to disregard the potential losses relevant to the credit card use (H7, H8, H9 are accepted). Consumers desire issuing banks receive their opinions, taking resources to investigate, handle fraudulent merchants, and against the attacks of technology criminals (Featherman et al., 2010). They also ensure the credit card payment will be successful with the exact amount stated with no additional fees (Kim & Lennon, 2013). Next, they can choose many ways to receive outstanding statements with information about closing balance, minimum amount, and due date. Thus, once the bank meets the aforementioned service requirements, consumers have no reason to worry about potential credit card-related losses.

The study provides a measurement for three components of perceived risk in sources relevant to using credit cards; they are transaction, payment, and credit risk. The SEM results confirm the negative effects of these risk perceptions on the intended use of credit cards (H10, H11, H12 are accepted). The analyses show consumers may worry about the possibility of unauthorised personal information collection and being bothered by unknown people. Meanwhile, it disturbs them about the loss of security when transmitting financial data through connected e-devices or attack from cyber-crimes (Featherman et al., 2010; Ozturk, 2016). They also consider how much money they pay to use, and failing to pay bills if it is defective or

expired. They are notpleased to use much time to troubleshoot and resolve complaints and being under pressure of the transaction until its confirmation (Trinh et al., 2020; Yang et al., 2015). Next, users are anxious about paying a high interest rate on credit card debt, paying interest on fraudulent transactions, falling into debt and being despised for debt and inability to repay (Jamshidi & Hussin, 2016). The potential losses associated with borrowing and repaying discourage individuals from adopting credit cards (Phan et al., 2019). Therefore, once consumers underestimate the potential losses on paying bills with credit cards, they are more likely to use them in daily payments.

7. Conclusion

This study is a pioneering effort in credit card adoption based on the SOR framework. In which perceived risk (organism) plays an intermediary role between the information system's quality (stimulus) and the intended use of credit cards (response). However, this study differs from the perspective of consequences in prior studies, this study considers risk perceptions in perspective of sources, which provides clarity as to why consumers worry about losses. Since this is a fresh approach in the credit card industry, the study performspreliminary research to describe and develop the scale of research constructs.

Using the data of 538 bank consumers from a convenient sampling, this study measures 7 research constructs with 28 observed variables. Market data is suitable for the measurement and the structural model. The study accepts all proposed hypotheses, in which information quality, system quality, and service quality has a negative impact on transaction risk, payment risk, and credit risk. Meanwhile, these risk components influence the intended use of credit cards in the opposite direction, with the explanation of 46.8% in the data's variation.

Besides the results achieved, the study also has some limitations. This study focuses on the perceived risk as an inhibitor of the intended use of credit cards, and how the quality of credit card systems may reduce that negative perception. However, consumers are rational; they often consider profits and losses when deciding. Perceived risk is an important barrier, but the values brought by credit cards may defeat it. Attitudes towards debt, which is important in one's decision to take consumer loans, may encourage consumers to use credit cards whether they perceive losses in their use. Future studies may address these shortcomings.

The study has contributed to the research framework of the stimulus organism response model. There is interesting evidence on the impact of information system quality on perceived risk. Subsequently, three components of perceived risk in source are identified, they are transaction risk, payment risk, and credit risk. Finally, these risk perceptions have negative, important effects on intended use of credit cards. These findings have good reference value in empirical studies on consumer behaviour in financial, banking, and technology products and services.

This study provides some practical contributions to the bank's credit card business. Banks can achieve a high-quality information system by providing complete, accurate, useful and timely information. Besides, banks promulgate policies, train a team of specialised, enthusiastic and thoughtful staff. Banks also conduct special investments to strengthen their technology infrastructure, and information security. These solutions may reduce consumer apprehension about potential credit card-related losses and increase consumers' intended use of credit cards.

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