

Full Length Research Paper

Designing a model for analyzing the effect of risks on e-banking adoption by customers: A focus on developing countries

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Recently, e-banking has become increasingly important in banking activities. The main reasons include modern technologies, expansion of competition, needs for efficient and comfortable services, cost and economical changes. The aforementioned factors cause complexity, challenge, ambiguity and risk feeling in the customers who use electronic capabilities. The main goal in this paper is to study the adopted customers risk on the development of e-banking. Therefore, five groups of risk were identified as performance, security, rule (law), time and financial categories. Then their effects were surveyed from the study of the sub groups on e-banking acceptance. Based on an empirical study in the field of e-banking, the authors validated a measurement model used to evaluate the adoption of risks in e-banking, based on the following risks: performance, security, law, finance and time. Finally, the results showed a significant relationship among the recognized factors and the extent of the adopted risk in e-customers. As the demographic factor of customers affected the e-banking acceptance, it also affected the amount of adopted risks in using e-banking. Consequently, the findings demonstrate that the risk of applying the electronic feasibilities differ from other mentioned factors from the customers' banking views. The SEM model also showed the meaningful casual correlations between some variables and the extent of using e-banking in this research. Findings show that the most important risk of acceptance in e-banking by customers in Iran as a developing country is the performance risk, and it must be related to the function of system servers or else, the situation of disconnection from the internet will occur while conducting online transactions because these situations may result in unexpected losses. The knowledge of these risks as major factors of consumers' adoption and perception in the internet provides banks as a useful tool for the establishment of an effective quality management for their e-businesses.

Key words: E-banking, e-customer, risk management, e-security, adopted risk, e-banking acceptance.

INTRODUCTION

Banks should provide their customers with convenience, which imply that they should offer service through several distribution channels (ATM, internet and physical branches) and have more functions available online. Other benefits are expanded product offerings and extended geographic reach. This means that banks can

offer a wider range and newer services online to even more customers than possible before. One of the issues currently being addressed is the impact of e-banking on traditional banking players. After all, if there are risks inherent in going into e-banking, there are other risks in not doing so; yet, it is too early to have a firm view on this. Even to practitioners, the future of e-banking and its implications are unclear. Moreover, It might be convenient nevertheless to outline briefly two views that are prevalent in the market (Mihalcesuse, 2000). E-banking or online banking is one of the electronically provided

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services from banks and all credit institutions. The mentioned services are offered to customers via the web. For these means, the banks have used information from technology facilities (Karvina et al., 2005). E-banking has helped banks to keep the current customers, increase customers' satisfactions, acquire further share of markets, decrease the operation costs and provide the best competitive situation for them (Alsomali et al., 2009). E-banking plays an important role in protecting several fields in e-commerce such as online-buying, online auction and stocks trade via the web. Beside these capabilities, e-banking has excessive benefits on the customers for its high speed in transactions and a lower cost for saving their accounts (Ming-Chi, 2009). However, there are many customers who wonder on how to use e-banking because of uncertainty in the virtual atmosphere, yet would not accept this facility (Kusima et al., 2007; Littler et al., 2006). Finally, the perceived doubts about e-banking cause customers to avoid using it and they made blocks to evade receiving online banking by the buyers (Ming-Chi, 2009). The large investment in banking to develop e-banking and have an appropriate understanding of the customers' resistance can help the bank managers plan their strategies in order to develop e-banking and persuading the customers to further use the online services (Ming-Chi, 2009). The banking industry has undergone significant operational changes over the last decade, with the help of advances in information technology. The rapid diffusion of the internet, in particular, has revolutionized the delivery channels used by the financial services industry. Globally, the amount of consumers using internet banking (IB) has grown steadily from 34.4 million users in 2000 to 122.3 million users in 2004, with most users coming from Western Europe (International Data Corporation, 2005). The importance of the internet in today's competitive and increasingly global banking environment has been widely acknowledged (Bauer and Colgan, 2001; Hughes, 2001; Li, 2001; Mols, 1999; Thorton and White, 2001), and a growing body of literature now exists on various aspects of online banking (Akinci et al., 2004).

The main goal of this study, with regard to the use of this new issue of development in developing countries, is to evaluate the impact of some key risks in adopting e-banking, particularly in Iran. The most important reason for the survey of developing countries is subsequently explained.

Background and literature

Researchers defined the electronic banking as the supply of the financial servicing in large and small size by new means such as ATM, telephone banking, etc (Pennathar, 2001). Factors affecting consumer acceptance and adoption of internet banking have been at the forefront of academic interest (Sathye, 1999; Howcroft et al., 2002;

Lassar et al., 2005; Lee et al., 2005; Rotchanakitumnuai and Speece, 2003; Littler and Melanthiou, 2006). However, as the user base of internet banking surpassed 100 million, it is time for banks to take into consideration also their existing internet banking users instead of concentrating only on attracting new ones. Thus, the research on internet banking has not addressed the characteristics and perceptions of existing internet banking users. The use of this new technology is too new to the developing countries, and this may be a cause of the lack of trust from the customers in using the internet banking or e-banking as a whole. When the customers have a feeling of no trust and uncertainty for the phenomena, it is believed that they look at it as a risk. This paper wants to survey and rate the well known risks in e-banking that affect customers' acceptance of it as the way of developing internet banking. The following studies help to find a better understanding of the subject. Mihalcesuse et al. (2000) found that e-banking creates issues for banks and regulators alike. For their part, banks should:

- (a) Have a clear and widely disseminated strategy that is driven from the top and which takes into account the effects of e-banking, together with an effective process for measuring performance against it.
- (b) Take into account the effect that e-provision will have upon their business risk exposures and manage these accordingly.
- (c) Undertake market research, adopt systems with adequate capacity and scalability, undertake proportional advertising campaigns and ensure that they have adequate staff coverage and a suitable business continuity plan.
- (d) Ensure they have adequate management information in a clear and comprehensible format.

E-banking is defined as the automated delivery of new and traditional banking products and services directly to customers through electronic, interactive communication channels. E-banking includes the systems that enable financial institution customers, individuals or businesses, to access accounts, transact business, or obtain information on financial products and services through a public or private network, including the internet or mobile phone. Customers access e-banking services using an intelligent electronic device, such as a personal computer (PC), personal digital assistant (PDA), automated teller machine (ATM), kiosk, or touch tone telephone in Virlanuta. Sohail and Shanmugham (2002) in their paper examines the current trends in the e-commerce revolution that has set in motion the Malaysian banking sector and reports on an empirical research that was carried out in Malaysia to study the customers' preference for electronic banking and the factors, which they considered to have influenced the adoption of electronic banking. Results based on the analysis of data

relating to 300 respondents indicate that while there is no significant differences between the age and educational qualifications of the electronic and conventional banking users, some differences exist on other demographic variables. The analysis further reveals that accessibility of the internet, awareness of e-banking and customers' reluctance to change are the factors that significantly affected the usage of e-banking in Malaysia. The paper discusses the implications of these. Limitations of the study are highlighted and further research directions are suggested. Broderick and Vachirapornpuk (2002) and Jun and Cai (2001) employ qualitative techniques. By using the critical incident technique, Jun and Cai (2001) identify 532 critical incidents in online banking, which are grouped into three central quality categories namely customer service quality, online systems quality and banking service products quality. Broderick and Vachirapornpuk (2002) tracked the member usage patterns over a three-month period based on a participant observation in an internet banking community. The bulletin board enabled discussion episodes on the experiences the participating members made with internet banking.

In total, 160 incidents from 55 topic episodes were analyzed. The findings show that the elements with the most immediate impact on service evaluation are cues in the service setting, and key events in the service encounters and the level and nature of customer participation. However, the results indicate an aggregated level of research, which makes a precise and testable measurement of service quality in internet banking impossible. In the case of e-banking portals, a study by Hans et al. (2004) showed that six main quality dimensions related to three generic service categories were identified: security/trustworthiness and basic services represent the basic demands of portal users and form the core service category. Attractive cross-buying services and added value constitute a second dimension representing the additional services that facilitate the use of the core products. A third dimension used for quality assessment consists of transaction support and responsiveness of the service provider which are assured by personalized offers and content as well as interactive decision tools. Alsomali, Gholami and Clegg (2009) in their study illustrated the technology acceptance model (TAM) and incorporated some extra important control variables. The model was empirically verified to examine the factors influencing the online banking adoption behavior of 400 customers. The findings of that study suggest that the quality of the internet connection, the awareness of online banking and its benefits, the social influence and computer self-efficacy have significant effects on the perceived usefulness (PU) and perceived ease of use (PEOU) of online banking acceptance. Education, trust and resistance to change also have significant impact on the attitude towards the likelihood of adopting online banking. The implications of the findings

are discussed and suggestions for future research are presented. However, Lee (2009) in his paper explained a developed model of TAM with a TPB to predict and explain customers' behavioral intentions with regard to adopting online banking in Taiwan. The proposed model incorporates five categories of perceived risk to provide a more comprehensive investigation covering both the positive and negative aspects of online banking. The results show that the proposed model has good explanatory power and confirms its robustness in predicting customers' intentions to use such services. As with any research, care should be taken when generalizing the results of this study. First, the survey was conducted using web based forms and employed a non-random convenience sample. Gathering a larger sample using an alternate survey modality and random sampling methods would be costly. The online survey method was appropriate for collecting data from participants with internet experience and who were free of geographical constraints. However, generalizability could be enhanced if future research is systematically sampled from a more dispersed sample. Secondly, in essence, causal relationships are likely to exist between perceived benefits and perceived usefulness. However, when the literature was first resurveyed, no evidence was found to support the existence of the causal relationships. Secondly, two causal paths were added "perceived usefulness (perceived benefits) and "perceived benefits" (perceived usefulness), respectively into the proposed research model and the structural equation analysis was rerun to validate whether or not there are possible causal relationships between them, but only obtained two insignificant path coefficients. While to date there is no direct evidence, it is still believed that the possible causal relationship between perceived benefits and usefulness is worth investigating in a future research. Also, he ranked five categories of perceived risks by the customers in Taiwan's online banking. This classification includes six groups as performance, financial, time, social and security risks. According to him, the security risk is the most important factor in the acceptance of e-banking by e-customers. Bauer (2003) believed that bankers and consumers are both interested in the potential for internet banking. Individuals have been adopting internet banking in large numbers, with more than half of all American households having some form of internet access by 2000. Banks too have been developing their infrastructure to address what they perceive as a growing demand for online services, with 84% of all accounts offering some form of internet banking by 1999. However, the adoption rate has not followed the hype. By 2000, the proportion of households using internet banking was less than 10%. This research looks at the critical factors needed to promote banking adoption from the consumer's perspective. A consumer utility maximization framework was used and was included in the consumption bundle's possibility of using conventional, phone-banking

and/or internet banking. Phone-banking is added because it could be seen as a substitute for internet banking. A lot of the same services are available on both, and many of these restrictions are the same, that is, no cash can be withdrawn from either of them. Fedrizzi et al. (2004), in their paper, presented a model for evaluating one of the factors that are conditioning e-business in general, and e-banking in particular, that is, transaction risk. The problem of fraud detection is a well known problem in banking settings, but it has been magnified by the advent of internet and the massive transfer of economic transactions from traditional face-to-face relations to virtual environments. It has also reached a world-wide extension, pushing banking institutions toward the regulation of e-banking usage.

Cunningham et al. (2005) in a research found that the perceived risks from the e-customers are different from the traditional one basically. In their findings, it is believed that the financial risk is the positive factor for confirming e-banking by customers, while the psychological, physical and time risks are considered as the negative cause of refusal by them. Georgesua (2000) surveyed the future of e-banking in Czech with regard to innovations in that country and the world. He mentioned that providing many facilities via the electronic distribution channel have several risks and benefits for e-customers, and considered the law risk as the most important risk because of the possibility of fraud. The paper suggested a mechanism for protecting e-customers from the mentioned risk in the web. In the other research, Sokolov (2007) explained the process of developing e-banking in Slovenia. He categorized the main risks related to electronic banks in strategic, operational, law and credit risk groups. He comprised the risks implications with the principles of risk management in the Buzzel committee. Other research from Cunningham (2005) investigates the premise, which opines that purchasing of e-banking services is perceived to be riskier than purchasing of traditional banking services. Unlike previous studies on perceived risk that typically focused on the relationship of perceived risk and information search, the exploratory study examines the dynamics of perceived risk throughout the various stages of the consumer buying process. When viewed as a dynamic process, perceived risk for e-banking services shows more radical changes in risk levels than traditional banking services. The analyses indicated that financial risk drives the risk premium, while psychological, physical and time risks play ancillary roles as risk drivers at certain stages of the consumer buying process. A major implication of that study is that there is a risk premium for e-banking services and the risk premium permeates all stages of the consumer buying process. However, risk mitigation strategies are addressed. The researchers propose an e-banking adoption model that identifies four factors that have been found to be influential in the perception of the strategic value of IT: performance support, operational support,

managerial productivity and strategic decision aids. Moreover, They also identified seven factors that influence electronic banking adoption: organizational readiness, infrastructural readiness, external dependency, intangible pressure, persuasive pressure, perceived ease of use and perceived usefulness. The result of this study emphasizes the essential difference in the attitude towards e-banking adoption between state owned and private owned banks. This dissimilarity has been found also in their attitude toward the strategic value of e-banking. In addition, it is also discovered that bank managers' perception toward e-banking is very positive and effective in their adoption trend. This perception will help them accelerate the adoption process (Aghdasi et al., 2008).

Survey of e-banking in developing countries

With the current rapid developments in information and network technology, banks are undergoing unprecedented and global changes. The traditional banking business has been significantly, and inevitably, impacted by the rapid technological development of non-banking high-tech industries. After becoming a member of the WTO, the developing countries' banks had to face challenges from foreign banks, which hold advantages in their advanced technology, stronger funds and modern management modalities. If those banks wish to enhance their competitive advantage in the financial industry, they will have to build their information technology, and in particular, their network technology in order to increase their adoption of the e-customers with the new circumstances. The most important reason for the survey of e-banking in developing countries is to increase it in other regions of the world. As it is already referred to, the level of e-commerce in the world has increased significantly in trend. The evidences show the B2C e-commerce growth, but slower than other forms of the electronic expanding programs because of the influencing factors (Lee, 2009).

Research on the consumer perceptions of innovative offerings has been shown on products as opposed to services. Perceived risk has generally not been awarded a major role, while uncertainty, which is viewed here as distinct from risk, has for the most part been disregarded. This study strives to identify some of the major risks and uncertainties associated with a new service, internet banking, during the early stages of its market development (Littler and Melanthiou, 2006). It was possible to identify several major 'risks' as well as 'uncertainties' (Yuan et al., 2010). Today, the internet has infiltrated every aspect of life, as exemplified by online entertainment, online shopping and internet banking, and these new technologies have affected and encroached on people's lives in many ways. The rapid development of internet banking may make life easier in some ways;

however, it must be remembered that there is another side to this issue, since it also changes lives and habits in unpredictable ways. The number of internet users around the world has been steadily growing and this growth has provided the impetus and opportunities for global and regional e-commerce. However, with internet, different characteristics of the local environment, both infrastructural and socioeconomic, have created a significant level of variation in the acceptance and growth of e-commerce in different regions of the world. Over time, various studies have been conducted and models have been developed to identify diffusion of e-commerce in different environments (Zwass, 1999; Wolcott et al., 2001; Travica, 2002).

These models have looked at “infrastructure” (for example, connectivity hardware and software, telecommunications, product delivery and transportations systems) and “services” (for example, e-payment systems, secure messaging, electronic markets, etc.) as the primary diffusion factors. In addition to the infrastructural issues, trust (in this paper, is called “transactional trust”) has been identified as one of the critical issues that confront new businesses or utilize new business models like e-commerce. Numerous studies have tried to find correlations between trust and experience with a new system, concept, or relationships, including a correlation to the frequency of e-commerce activity, and as such, other researchers have noted that trust may be significantly influenced by the culture of a given society (McKnight et al., 1998; McKnight and Chervany, 2001; Lee and Turban, 2001). Grabner-Kraeuter observes and states that trust is the most significant long-term barrier for realizing the potential of e-commerce to consumers (Grabner-Kraeuter, 2002), and others state that trust is the key differentiator that will determine the success or failure of many web companies (Urban et al., 2000).

However, there are few empirical e-commerce studies in the developing world (Abousaber et al., 2007; Aladwani, 2004). While some countries are the most technologically advanced countries in the Middle East region (13), the rest of the Middle East countries are considered as the least technologically advanced nations in the world (36). Several scholars, like Ali (2004), Kulchitsky (2004), Masa'deh and Al-kharabsheh (2005) and Polatoglu and Ekin (2001), have called for further research in the Middle East countries to investigate both of facilitators and hinder factors of technology and telecommunications adoptions.

Furthermore, in the course of studying the e-commerce literature, the researchers found that there is a lack of published studies addressing e-commerce obstacles in the developing countries. Moreover, according to the latest report from the like regions, e-commerce usage and growth is very limited (Ziad et al., 2009). Some researchers have emphasized on the potential benefits that the internet offered SMEs, which creates an

unprecedented opportunity for them to engage in national and international marketing campaigns that previously have been unaffordable (Ziad et al., 2009). Since e-commerce solutions are aimed to facilitate the implementation of firms' global marketing strategies, it is believed that a single online store platform and design is sufficient to attract customers' purchase from the website. According to this approach, all individuals living in any location in the world have similar perceptions and expectations about the elements of online environment including confidentiality dimensions (Peikari et al., 2010). However, some studies conducted in a cross-country context show different results (Cyr, 2008; Cyr and Trevor-Smith, 2004; Liu et al., 2004; Talukder and Yeow, 2006; Peikari, 2010). Moreover, Connolly and Bannister (2007) argue that many of the research available on e-commerce have been conducted in US, a country with high level of individualism and uncertainty avoidance and therefore, the findings of such research cannot be generalized to other countries with different cultures. According to Talukder and Yeow (2006), there is a big difference in IT and particularly e-commerce infrastructures between developing and developed countries. Therefore, there is a need to conduct more studies between the developed and developing nations and examine the differences on their perceptions about the attributes of online environment.

The most important risks in e-banking with regard to previous studies

By considering the findings of the research in other countries, the researchers found 5 kinds of risks: (1) Security, (2) financial, (3) social, (4) time and (5) performance risks in e-commerce area. Moreover, through the research carried out in Iran, 2 more kinds of risks were discovered which are: (6) legal and (7) hardware risks based on the fact that e-commerce is a kind of newly established business in Iran from the customers' point of view (Table 1).

In the following lines, using the previous definitions for all kinds of risks, a brief introduction to each kind of risk will be given from the customers' viewpoint:

- (1) Performance risks: This risk is related to the potential or imposed damage, which is caused by technical deficiencies or improper functioning of e-banking systems.
- (2) Social risk: The potential or imposed damage that cause the loss of social status of people because electronic banking services are used among other authority groups.
- (3) Time-loss risk: This risk refers to the potential or imposed damage caused by wasting time and it brings about problems because of the delay in leading e-banking operations and also spending time on learning how to use e-banking tools and devices.

Table 1. The total findings of research on perceived risks in e-banking.

The risks The authors	Performance risk	Social risk	Time loss risk	Financial risk	Security risk	Legal risk	Software risk
Bauer (2002)					*		
Lim(2003)	*	*	*	*	*		
Fiderman et al. (2003)	*	*	*	*	*		
Cunningham et al.(2005)			*	*			
Georgescu (2005)						*	
Sokolov (2007)	*			*	*	*	
Kim et al. (2008)						*	
Lee (2009)	*	*	*	*	*		
Bauer (2002)	*	*	*	*	*		
Lim(2002)					*	*	*
Fiderman et al.(2003)					*		*
Cunningham et al) .2005)						*	*
Georgescu (2005)	*				*	*	*

(4) Financial risk: This risk is known as the potential or imposed financial risk which is caused by errors in e-banking operations or misuse of bank account in e-banking systems.

(5) Security risk: This is defined as a potential loss due to fraud or the hacker compromising the security of an on-line transaction or on-line user.

(6) The legal risk: It refers to the potential or imposed damage which is the result of lack of any compiled law for electronic crime or lack of knowledge in this area.

(7) Hardware risk: It refers to the potential or imposed risk which is caused because of the lack of new tools when compared to the number of the customers, inaccessibility of such tools (cell-phones or the internet) and the time-consuming process of repairing and maintaining such tools.

Finally, in this research, an attempt was made to present a new category of perceived risks in Iran's e-commerce by reviewing the literature of research related to the field of perceived risks in Iran's e-commerce and other foreign countries. Such risks are commonly known as the significant barriers for the improvement of e-commerce.

Such research was carried out so that later on, researchers will be able to enhance the subject and consider it from other angles and therefore they will be able to measure the effect and the significance level of such risks in e-commerce system.

Research model and hypotheses

Based on the theoretical model previously developed, six research hypotheses were formulated. Since they are used as the base models, there is need to test the following hypotheses in the context of online banking

adoption. Hypotheses 1 and 2 are proposed based on well known risks and hypotheses 3, 4, 5 and 6 are evaluated on the individual factors of adopting e-banking by customers.

H₁: There is a significant relation between the perceived risks and the use of e-banking.

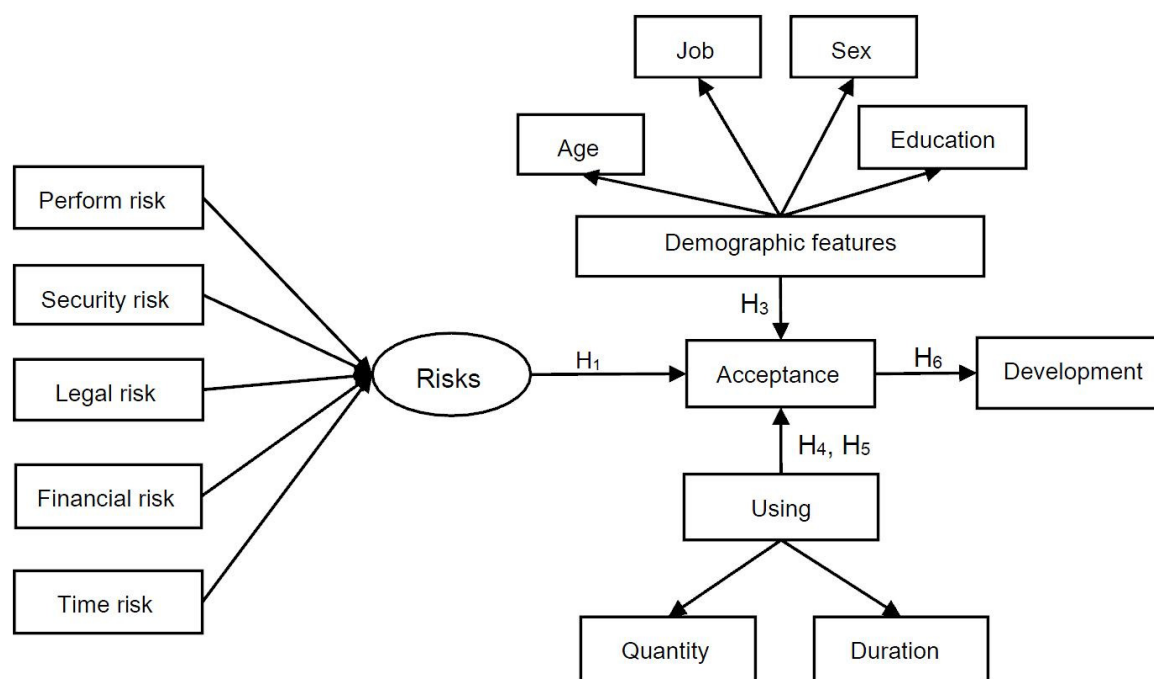
H₂: The perceived risks by the customers have different importance on their acceptance of e-banking.

H₃: Demographics features of the customers affect their use of e-banking.

There are many researches and studies that analyzed the impact of the use of internet banking by customers on the relationship they develop with their main bank. Berry (1983) was the first author to introduce the relationship approach concept and he referred to all marketing activities carried out by a company in order to establish, develop and, above all, maintain customer relationships (Berry, 1983; Morgan and Hunt, 1994). Although there is lack of consensus concerning the definition of relationship marketing (Shirvastava and Kale, 2003; Proença and Fernandes, 2005), the underlying principle of RM involves maximizing the long-term benefits for both parties involved. Recently, the strategic benefits of adopting the relationship approach in the banking sector was discussed (Bennett and Durkin, 2002), concluding that it is essential for the banks to know its customers well and build a strong, trusting relationship with them, which is particularly important in the financial services sector due to the complexity of many of its products (Diacon and Ennew, 1996; Bejou et al., 1998) such as commitment, honesty and cooperation between the institution and its customers (Tyler and Stanley, 1999; Rexha et al., 2003), as well as customer satisfaction. The relations between the dimensions that constitute the

Table 2. The results and analysis of the main factors.

Items (risks)	Question numbers	Extraction average	Total variance explained	Eigen value	Cronbach's alpha
Performance	Q8-Q13	0.642	22.630	5.658	0.705
Security	Q14-Q18	0.712	9.819	2.455	0.889
Rule(law)	Q19-Q22	0.663	7.443	1.861	0.718
Finance	Q23-Q28	0.622	7.206	1.801	0.724
Time	Q29-Q32	0.636	6.869	1.717	0.721
KM=0.888		Bartlett's test of sphericity: 1797.303 Sig=0.000			

**Figure 1.** The proposed research model.

concepts under study were researched, that is, the use of internet banking and the relationship marketing approach in banking. The results show that the relationship of the marketing approach is sensitive to the intensity of the internet banking usage, as well as to the diversity of operations performed there.

The use of internet banking is influenced by the duration and maintenance of the relationship established between the customer and the bank.

It is, however, important to mention that the intensity of usage is the only dimension that has relevant impact on some of the dimensions of the relationship of the marketing approach, and, even so, on the bank's adaptability.

This means that the banking institution has greater concerns in adapting to customers that use internet banking intensively, which may mean that customers' needs are better met and, therefore, that there are more satisfied customers who are more likely to maintain a

lasting and stable relationship with the bank.

The fact that there is a strong association between the duration and maintenance of the relationship and diversity of places of access to internet banking (understood as the reflection of greater trust in technology), may mean that the bank's greater attention to the customer (conveyed by the bank's adaptation to his characteristics) is reflected in the customer's trust of this technology. In this way, the customer intensifies the use of technology and a virtuous circle is developed (Proença and Silva, 2004). Therefore, three assumptions are derived based on these studies:

H₄: The frequency of usage has positively influence the acceptance of e-banking.

H₅: The duration of usage has positively influence the acceptance of e-banking.

H₆: The rapidity of acceptance has positively influence

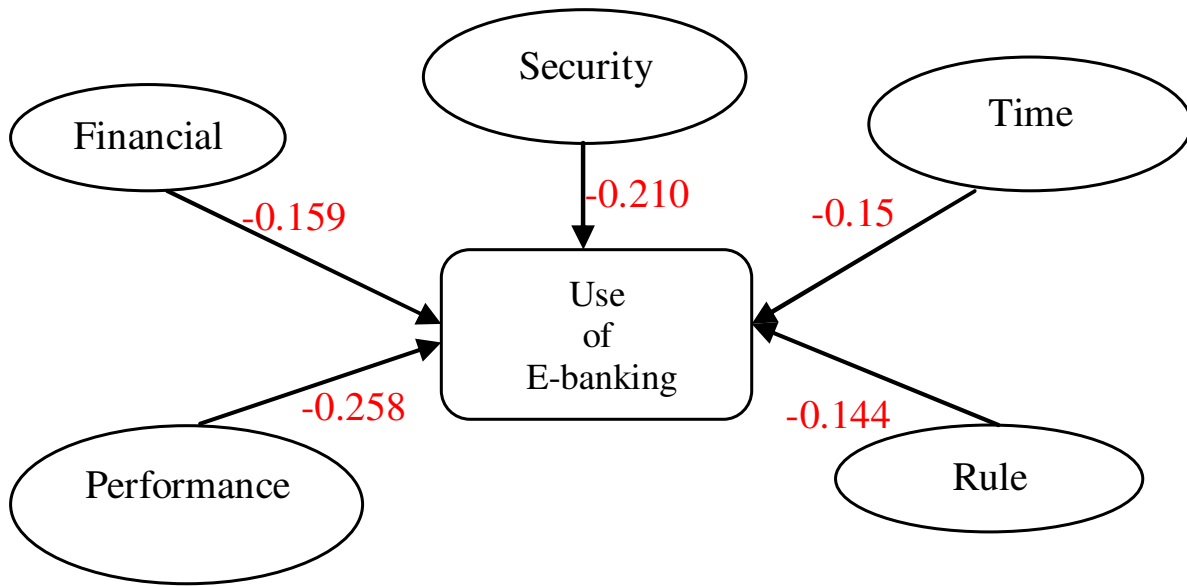


Figure 2. The analyze of correlation between the risks factors and using.

Table 3. Sample demographics

Total usable responses	170
Gender: Female	16.5%
Gender: Male	83.5%
Age mean	21-35 years
Standard deviation(age)	2.97
Job mode	Employee (administrative)
Education mode	College
Time average of using e-banking	3-5 years

the expansion of e-banking in the developing countries.

METHODOLOGY

The research method of study is descriptive and the correlation approach is used to analyze the gathered data. In order to collect of electronic banking users' information, a questionnaire was structured and distributed in the Melli bank in Iran to express the need for the information research purposes. The validity of the questionnaire was calculated by the method of factor analysis and its reliability was defined by Cronbach's alpha coefficient. Thus, the results were shown in Table 2.

The variables of risk that were the main assessable factors in this research were evaluated and surveyed via five factors that were shown in Table 1. The study's method was the confirmative factor analysis and the results explained an agreeable consequence. The extraction averages were close to 1, the total variance explained were a bit further than 0.50 and the Eigen values were more than 1. Also, the results illustrated that the KM score and the Bartlett's test were both significant. Consequently, according to Table 2 and Figure 2, the mentioned factors are appropriate in studying the organizational structure's components.

This study, which yielded 170 responses, was conducted for three months, with incomplete responses and missing values deleted, resulting in a sample size of 170 users for an overall response rate of 100%. Sample demographics were depicted in Table 3, where 83.5% of the respondents were males and 16.5% were females. The majority of respondents (71%) were over 30 years old. About 96% of the respondents have an experience of online banking. Finally, the education levels of respondents were college (69.4%) and high school (30.6%).

Analysis of the hypotheses

H_1 : There is a significant relation between the perceived risks and the use of e-banking.

In the first step, the effect of perceived risks was assessed by customers on the use of e-banking wholly. According to Table 3, there is a significant correlation of the five risks on the studied customers feeling about use of e-banking and its facilities. In the other hand they have affect the using of this new method in banking.

Table 4. Analysis of the effect of risks on the use of e-banking.

		Correlations	
Factors			Use of e-banking
Performance	Correlation coefficient		-0.258 [*]
	Sig. (2-tailed)		0.041
	N		170
Security	Correlation coefficient		-0.210 ^{**}
	Sig. (2-tailed)		0.001
	N		170
Rule	Correlation coefficient		-0.144 [*]
	Sig. (2-tailed)		0.006
	N		170
Financial	Correlation coefficient		-0.159 [*]
	Sig. (2-tailed)		0.048
	N		170
Time	Correlation coefficient		-0.150 [*]
	Sig. (2-tailed)		0.038
	N		170

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).

Table 5. Analyzing the effect of risks on acceptance ANOVA (b)

Model		Sig.	F	Mean square	df	Sum of squares
1	Regression	0.000(a)	49.338	4.382	5	21.910
	Residual			0.089	164	14.566
	Total				169	36.476

a. Predictors: (Constant), time, rule, performance, financial, security; b. dependent variable: acceptance.

Table 6. Analyzing the effect of variables on the main factor (Model summary).

Model	Std. Error of the estimate	Adjusted R square	R square	R
1	0.29802	0.588	0.601	0.775(a)

a Predictors: (Constant), time, rule, performance, financial, security.

According to the table 5, the presented model is validated. Moreover, the R square (R = 0.601) in the table 6 shows that the perceived risks have a considerable impact on the adoption of the E-banking. According to Table 4, there is a significant correlation in the five risks on the studied customers feeling about the use of e-banking and its facilities. On the other hand, the use of this new method in banking has been affected.

The aforementioned results show that there is a significant relationship between the risks factors and use of electronic banking. In the statistical operation, the amount of Durbin-Watson was seen as 1.73, which was

more than one and $F = 49.83$ and $\text{sig.} = 0.000$. H_1 is confirmed by this result, while on the other hand, the risks factors positively affect the use of e-banking.

H_2 : The perceived risks by customers have different importance in their acceptance of e-banking.

According to Table 7, the extent of the importance of risks on the effect of e-banking use is different. On the other hand, the table showed that the performance risk has further effect on all those risks. Other tables illustrated a ranking of the importance of risk's effect (Table 8).

Table 7. Analysis of importance factors.

Paired samples test		Paired differences					t	df	Sig. (2-tailed)
Pairs	Compares	Mean	Std. deviation	Std. error mean	95% Confidence interval of the difference				
					Lower	Upper			
Pair 1	Perfo -Security	.33510	.82198	.06304	.21064	.45955	5.315	169	.000
Pair 2	Perfo - Rule	.28922	.77568	.05949	.17177	.40666	4.861	169	.000
Pair 3	Perfo - Finance	-.00686	.68042	.05219	-.10988	.09616	-.132	169	.896
Pair 4	Perfo- Time	-.61814	.68519	.05255	-.72188	-.51440	-11.762	169	.000
Pair5	Security - Rule	-.04588	.69889	.05360	-.15170	.05993	-.856	169	.393
Pair 6	Security- Finance	-.34196	.73452	.05634	-.45317	-.23075	-6.070	169	.000
Pair 7	Security- Time	-.95324	.93120	.07142	-1.09423	-.81225	-13.347	169	.000
Pair 8	Rule- Finance	-.29608	.69551	.05334	-.40138	-.19077	-5.550	169	.000
Pair 9	Rule- Time	-.90735	.83552	.06408	-1.03386	-.78085	-14.159	169	.000
Pair 10	Finance- Time	-.61127	.63871	.04899	-.70798	-.51457	-12.478	169	.000

Table 8. Descriptive statistics of the risks.

Descriptive statistics					
	N	Minimum	Maximum	Mean	Std. deviation
Performance	170	1.67	5.00	3.9250	.67142
Security	170	1.00	5.00	3.3137	.98493
Rule	170	1.00	4.75	2.9718	.85510
Finance	170	1.00	4.67	3.3069	.66489
Time	170	1.75	5.00	3.0176	.62484

According to Table 8, the maximum importance of risks is related to performance risks while the lowest importance is related to law or rule risk from the e-customers' view of banks.

H₃: Demographics features of the customers' effect on their use of e-banking.

According to Table 9, education of customers can

affect their acceptance of e-banking, but two factors, age and sex did not have a meaningful role in the adoption. On the other hand, customers who have college education accepted technology earlier than other people with lower educated degree. There is no significant relation between age and sex as regards the use of internet or other facilities in banking. Therefore, the age and sex of people cannot be claimed to affect their use

of online banking in Iranian customers who access the web.

H₄: The frequency of use has positive influences on the acceptance of e-banking.H₅: The duration of use has positive influences on the acceptance of e-banking.

According to Tables 10 and 11, the duration and

Table 9 Analyzing the effect of demographic factors on acceptance (Model summary).

Factors	Sig.	T	B	Std. error of the estimate	Adjusted R square	R square	R
Education	0.00	13.55	3.45	0.3211	0.456	0.459	0.678
Age	0.567	0.878	0.0192	0.061	0.0001	0.0001	0.012
Sex	0.879	0.037	0.012	0.301	0.0123	0.0144	0.12

Table 10. Analyzing the effect of duration and frequency factors on acceptance (Model summary).

Factors	Sig.	T	B	Std. Error of the estimate	Adjusted R square	R square	R
Duration	0.000	23.45	3.67	0.31981	0.753	0.755	0.869
Frequency	0.000	19.98	2.11	0.4321	0.411	0.4277	0.654

frequency of e-banking use by customers can affect their acceptance of online banks, in order for those factors to have a meaningful role in the adoption. Also, the extent of their usage has a positive effect on them. Therefore, it can be claimed that the way customers use e-banking affects their acceptance of online banking in Iranian customers who access the web.

H₆: The rapidity of acceptance has positive influences on the expansion of e-banking in the developing countries.

For surveying the relation between the acceptance of e-banking and its development, there is need to survey the effect's amount of the main factors on the important variable as developing. For this reason, the analysis was done by SEM method via Lisrel software. In Figure 3, the resulted model was shown. In that model, the relation of the three groups of variables (risks group, customer group and demographic variables) was illustrated, after which the final analysis was shown in the next model.

The analytical model shows that there is a meaningful relationship between the three main group variables as risks and other dependent variable (acceptance) (Tables 5 and 6). Also, there is a factor known as moderator variable which influence adoption. The aforementioned model, assessed by Lisrel software, was used for analyzing SEM. Performance (-0.258), security (-0.210), financial (-0.159), time (-0.150) and law (-0.144) risks all have an effect on risks construction; although all risks generally have a -0.52 effect on the acceptance of e-banking. When age and education variables were evaluated, the result showed that age, sex and job have no meaningful influence on the main variable. Consequently, for e-customers, the kind of jobs they have is not important. Also, their age or sex is not essential. On the other side, education has a significant influence on the acceptance of online banking (0.524). For defining the effect of personal use of these new facilities, two factors were surveyed as quantity and duration of e-banking usage. The results explained that the duration of use has further influence on electronic banking from the other factor. In order to know how long people use this

service can affect quickly the acceptance of it. In the final assessment, an influential effect was found on the development of online banking among Iranian customers. In developing e-banking, it is necessary that this situation would be powered. In powering the attitude of using e-banking in developing countries like Iran, it is essential that the acceptance of innovations would be adopted by people.

CONCLUSION AND ADDITIONAL DISCUSSION

This paper aims to develop an extended model to predict and explain customers' risk behavior with regard to adopting online banking. The proposed model incorporates five categories of perceived risk to provide a more comprehensive investigation covering the positive and negative aspects of factors that influence electronic banking. The results show that the proposed model has good clarifying influence and confirms its strength in predicting customers' attitude of usage. This study has identified two aspects (demographic and situation of use) influencing consumers' adoption of online banking, and it is important to recognize the cultural and regional limitations of these findings on one side and the national limitations on the other side.

This is because cultural differences have been found with respect to how individuals respond well to defined risks (Lee, 2009). Moreover, according to other researches, the individual's understanding of risk differs between people and is likely to affect the perceptions of the presence of risks, as well as the evaluation of risks. In other words, the customers' acceptance of online banking may be indirectly influenced by a personal feature. However, this result needs further investigations and studies. Hence, the replication of this study on a wider scale with different national cultures is essential for the further generalization of the findings.

Obviously, it is a bank board, and management should understand the risks associated with e-banking services and evaluate the resulting risk management costs against the potential return on investment prior to offering

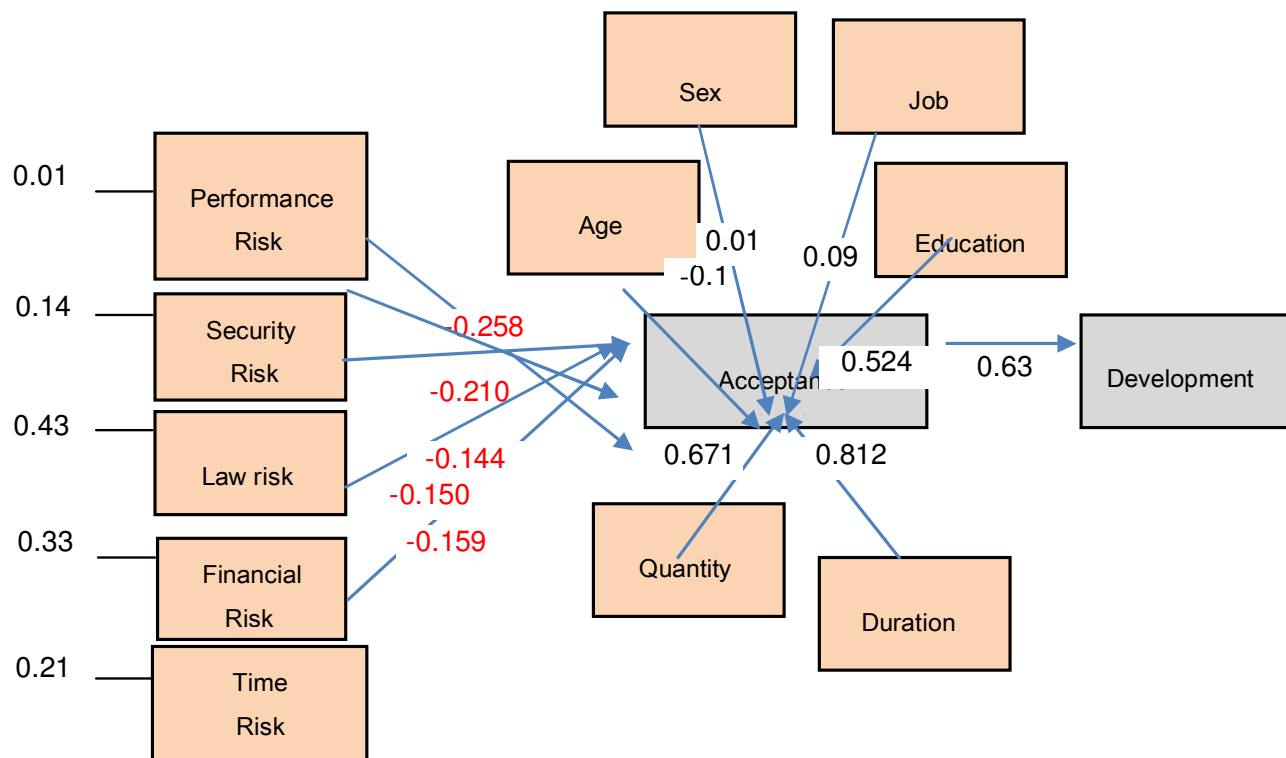
Table 11. T test analysis of the effect of duration and frequency factors on acceptance (Independent samples test).

		Levene's test for equality of variances		t-test for equality of means							
		F	Sig.	t	df	Sig.(2tailed)	Mean difference	Std. error	95% Confidence Interval of the difference		
										Lower	Upper
Duration	Equal variance assumed	6.638	0.0110	8.069	167	0.000	2.68430	0.33268	2.02751	3.34109	
	Equal variance not assumed			16.933	9.080	0.000	1.89418	0.15853	2.32617	3.04243	
Frequency	Equal variance assumed	0.9390	0.334	7.545	167	0.000	2.68430	0.25107	1.39851	2.38985	
	Equal variance not assumed			12.467	7.671	0.000	1.89418	0.15193	1.54119	2.24717	

e-banking services. Early adopters of new e-banking services can establish themselves as innovators who anticipate the needs of their customers, but may do so by incurring higher costs and increased complexity in their operations. The analysis further reveals that accessibility of the internet, awareness of e-banking and customers' intention to use new technology are the factors that significantly affected the use of e-banking in Iran. As it is explained already, e-banking is defined as the automated delivery of new and traditional banking products and services directly to customers through electronic and interactive communication channels that tried to reach a widespread usage of it, and which decreased any potential risks that the customers imagined. For this reason, bank managers should plan to provide this view that e-banking includes the systems that enable financial institution customers, individuals or businesses, to access accounts, transact business, or obtain information on financial products and services through a public or private network, including the internet or other tools of services in new banking. According to the results of this study, customers who access e-banking services using an intelligent

electronic device, such as a personal computer, personal digital assistant, automated teller machine, kiosk, or telephone banking capacities have really understood the electronic financial devices. On the other hand, customers with repeated access to online facilities can accept, very quickly, e-banking. The most important effect on the use of internet banking as opined by the respondents is the risk of suspending it in the virtual world. The issues examiners should consider when reviewing informational websites include: (i) Potential access to confidential financial institution or customer information if the website is not properly isolated from the financial institution's internal network; (ii) potential liability for spreading viruses and other malicious code to computers communicating with the institution's website; and (iii) negative public perception if the institution's on-line services are disrupted or if its website is defaced or otherwise presents inappropriate or offensive material. This factor (known as risk) can thwart customers' entrance into the web and is a cause of reduction of the electronic banking plans, especially in the developing countries. Another result of the lack trust in e-banking refers to the shrinkage of customer's

attitude towards e-banking adoption between new users and old clients. This dissimilarity has been found also in their attitude toward the strategic value of e-banking. In addition, it is also discovered that bank managers' perception toward e-banking is very positive and effective in their adoption trend. Besides, the attitude of customers can affect other people who want to access internet banking. According to the study's suggested model, the bank managers should concentrate on the risks as very important factors in e-banking and the ease of using it as the other cause of developing it in the new banking service. However, one of the benefits that banks experience when using e-banking has been explained as increased customer satisfaction. This due to the fact that customers may access their accounts whenever and from anywhere they like, and they get involved more, which creates relationships with banks. Therefore, the Iranian banks should provide their customers with convenience, that is, offering service through several distribution channels (ATM, internet and physical branches) and have more functions available online. Other plans would be expanded product offerings and extended geographic attainment. This means that



Chi-Square=22.11, df=12, P-value=0.00000, RMSEA=0.112

Figure 3. The SEM model for analyzing the relation between the factors.

banks can offer a wider range and newer services online to even more customers than it was possible before. The benefit which is driving most of the banks toward e-banking is the reduction of overall costs, and then it can decrease the risk of financial cost. With e-banking, banks can reduce their overall costs in two ways: cost of processing transactions is decreased and the numbers of branches that are required to service an equivalent number of customers are reduced. For minimizing other risks, such as performance risk, the bank administrators can make the best use of the internet or a new way of reviewing personal accounts. It seems that trust is the next factor, since security risk has a similar value with financial risk from customers in the web. Consequently, e-banking risk arises from fraud, processing errors, system disruptions, or other unanticipated events resulting in the institution's inability to deliver products or services. This risk exists in each product and service offered. Institutions should determine the appropriate level of security controls based on their assessment of the sensitivity of the information to the customer and the institution, and on the institution's established risk tolerance level. The findings, in Iran as a developing country, show that the most important risk in accepting

e-banking by customers is the performance risk. This must be related to the function of system servers or the situation of disconnection from the internet will occur, while conducting online transactions because these situations may result in unexpected losses.

In this study, the negative impact of risks on e-banking adoption was shown. Also, a positive effect was shown from the duration of using electronic banking to the time of accepting it.

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