

An investigation of Internet Banking Acceptance in Iran

Mina Ostovari ^a, Amir Albadvi* ^b, Mohammad Aghdasi ^c

Department of Industrial Engineering, Faculty of Engineering, Tarbiat Modares University, Tehran, Iran

^a minaostovari@gmail.com, ^b albadvi@modares.ac.ir, ^c aghdasim@modares.ac.ir

Abstract

These days, Internet banking (IB) is very popular among banking customers. However, in developing countries where IB is still in its infancy, many customers prefer traditional banking. In this study, we investigate some customers' beliefs about offline banking and their effects on trust in IB and IB usage. In order to do so, we developed a model based on Trust-TAM model and model of Trust-Transfer. A web-based survey was performed to collect data and 190 valid responses were collected. We used structural equation modeling for analyzing the hypotheses. The findings of the study revealed that belief of customers about institution based structural assurance in offline banking has positive effects on trust of customers in IB and also perceived structural assurance. Moreover, it was revealed that perceived usefulness and perceived satisfaction affect intention to use of IB. These results can be useful for banking managers and will help them to develop successful strategies in order to increase IB usage among customers.

Keywords: Internet banking, TAM, confirmatory factor analysis, structural equation modeling

Introduction

These days, banks prefer to deliver their services via new channels such as Internet. Although these channels seem to have lots of advantages for banks and also banks' customers, there are still customers who prefer traditional banking. This is more common in developing countries where IB is not still very popular. This shows the need for thorough searches about the factors that affect customers' usage of IB. In this research, we developed a model based on two well known models, Trust-TAM (Gefen, Karahanna, & Straub, 2003) and model of Trust-Transfer (Lee, Kang, & McKnight, 2007), to investigate the factors that affect customers' intention to use of IB in Iran. In the next section, we review the technology acceptance models and importance of trust in online environment. Then, we present the model, hypotheses and data analysis. The last section presents discussion of the findings and managerial implications.

Literature review

Information technology has made fundamental changes in different aspects of life. All these technologies are intended to facilitate life, but people usually do not accept changes easily. This has prompted researchers to investigate the factors which prevent or provoke users to use new technologies. One of the very first models for investigating user acceptance of new technologies is Technology Acceptance Model (TAM) (Davis 1989; Davis, Bagozzi, & Warshaw, 1989). Davis introduced TAM based on Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). "TAM was developed to explain and predict computer-usage

behavior” (Klopping & McKinney, 2004). Researchers have used TAM in different contexts. For investigating Internet banking acceptance, Suh and Han (2002) added trust as a new construct to TAM and posited that it affects attitude toward using and behavioral intention. Data were collected via a web survey from 845 Internet banking users of five major banks of Korea and the finding revealed that trust is an important belief that explains customer attitude toward using IB and also approved the result from the original TAM model. Gefen, Karahanna & Straub (2003) introduced a model based on TAM to investigate factors that affect consumer decision to return to an e-vendor. They posited that trust in an e-vendor is dependent on four factors, calculative-based, institution-based structural assurance, institution-based situational normality, and knowledge-based familiarity; they also posited that institution-based situational normality and knowledge-based familiarity are antecedents of perceived ease of use. Data were collected from 213 graduate and undergraduate students in a leading business school. The findings revealed that trust and TAM affect the purchase intention from e-vendors. In every environment with risk and uncertainty, trust has a critical role and can mitigate the risk (Palvia, 2009). Doney and Cannon (1997) posited that trust between a trustee and a truster develops when the truster forms expectations about the motives and behaviors of a trustee. Trust is defined by Moorman, Zaltman & Deshpandé (1992) as "a willingness to rely on an exchange partner in whom one has confidence" (Moorman, Deshpandé, & Zaltman, 1993, p. 82). “Trust, in a broad sense, is the confidence a person has in his or her favorable expectations of what other people will do, based, in many cases, on previous inter-actions” (Gefen, 2000, p. 726). Flavian, Guinalú & Torres suggested that when customers trust in the brick-and- mortar bank, this will prompt them to use the online service of that bank as they feel that the online service is trustworthy like the brick-and-mortar bank (Flavian, Guinalú & Torres, 2006). Lee, Kang & McKnight (2007) studied whether trust in offline bank transfers perceptions about the online bank. They studied four perceptions in their model: flow, structural assurance, perceived web site satisfaction, and perceived extent of future use. They used a sample of 199 South Korean consumers and the results revealed that offline trust influences all four online perceptions so offline to online transfer should be considered when strategies for online channels are being designed.

Research model and hypotheses

Based on the presented literature a model based on two well-known models, Trust-TAM model (Gefen, Karahanna, & Straub, 2003) and model of Trust-Transfer (Lee, Kang, & McKnight model ,2007) is developed. The research model is depicted in figure1.

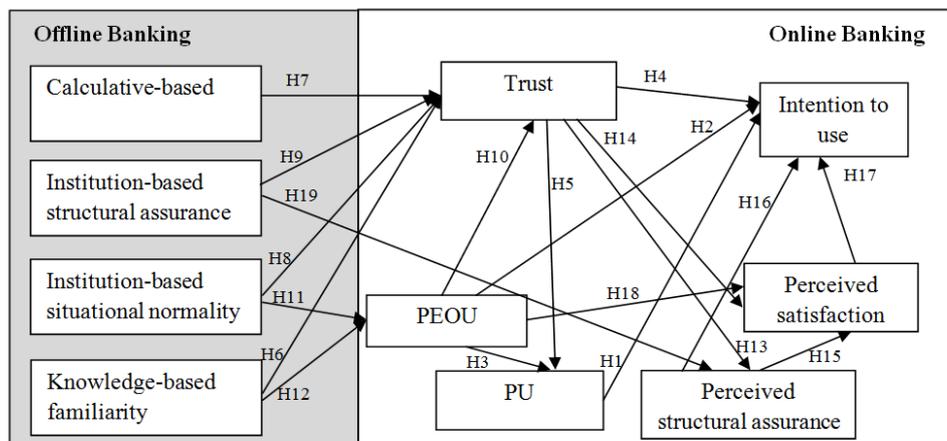


Figure1. Research model

According to Trust-TAM model, trust in online environment is affected by four factors, Calculative-based, Institution-based structural assurance, Institution-based situational normality and Knowledge-based familiarity. We study these factors in offline environment and how they can affect trust in IB. It is hypothesized that the paths from previous models remain the same. The Hypotheses are as follows:

- H1: Perceived Usefulness (PU) has positive effect on intention to use of IB.
- H2: Perceived Ease of Use (PEOU) has positive effect on intention to use of IB.
- H3: PEOU has positive effect on PU.
- H4: Trust in IB has positive effect on intention to use of IB.
- H5: Trust has positive effect on PU.
- H6: Familiarity with offline bank has positive effect on trust in IB.
- H7: Calculative-based belief about the offline bank has positive effect on trust in IB.
- H8: Situational normality has positive effect on trust.
- H9: Institution-based structural assurance has positive effect on trust.
- H10: PEOU has positive effect on trust in IB.
- H11: Situational normality has positive effect on PEOU.
- H12: Familiarity has positive effect on PEOU.
- H13: Trust has positive effect on perceived structural assurance.
- H14: Trust has positive effect on perceived satisfaction.
- H15: Perceived structural assurance has positive effect on perceived satisfaction.
- H16: Perceived structural assurance has positive effect on intention to use of IB.
- H17: Perceived satisfaction has positive effect on intention to use.
- H18: PEOU has positive effect on perceived satisfaction.
- H19: Institution-based structural assurance has positive effect on perceived structural assurance.

Measurement development

The questionnaire was designed using five point Likert scale and has two sections. The first section includes demographic and technological information. Demographic part includes questions about respondents' gender, age and highest level of education. Technological part includes questions such as duration of using banking services (in years), daily Internet use, Duration of using Internet (in years), Duration of using Internet banking (in years), and Types of Internet banking services used by the respondents. The second section includes questions about the model's constructs. For these questions, items from previous studies were adapted to be applicable in this study. The questions related to trust, perceived usefulness, perceived ease of use, and intention to use were adapted from the questionnaire of Suh and Han (2002). We designed the questions of calculative based, institution based structural assurance, knowledge based familiarity, and institution based situational normality based on the questionnaire of Gefen, Karahanna & Straub (2003). The questions of perceived structural assurance and perceived satisfaction were adapted from Lee, Kang & McKnight (2007). To validate the questionnaire, we performed a pre-test and a pilot test before running the main survey. To perform the pre-test we asked 3 banking expert and also 2 professors who were experts in IB to review the appropriateness of the questions. Then, a pilot test was conducted among 30 people who were chosen randomly. The internal consistency reliability of all questions was assessed by Cronbach alpha. Peterson (1994) posits that depending on the type of research, acceptable value of Cronbach's alpha can vary between 0.5 and 0.95. (Pikkarainen, T., Pikkarainen, K., Karjaluoto, Pahlila, 2004) From 35 questions, two questions, Trust1 and Trust2, were dropped due to the low reliability. For all

the other questions, the Cronbach alpha exceeded 0.7 except institution-based structural assurance and knowledge based familiarity that their Cronbach alphas were around 0.6. Some wordings were re-specified to clarify the meaning of the question. We examined the convergent validity using factor analysis for every construct. The result showed that the questions of each construct loaded on one factor so they were unidimensional. The refined questionnaire consisted of 44 questions, 11 questions were related to demographic and technological part and 33 questions were related to hypotheses.

Web-based survey

To target the Internet banking users a web based survey was developed. Emails containing the link of questionnaire homepage were sent to 2000 people. The questionnaire had an opening with the instruction of filling it. Respondents were asked not to fill the questionnaire if they had not used IB before. Respondents were asked to answer the questions based on their experiences with the online and offline branches of one specific bank chosen by them. Respondents could choose their answers from one of the terms: strongly disagree, disagree, neutral, agree, and strongly agree. In total, 217 cases were gathered from June to August 2010 from which 27 were discarded due to missing values resulting in a sample size of 190 with the overall response rate of 9.5 %. As web-based surveys are not very common in Iran, this low rate is understandable. Of the respondents, 80 were women and 110 were men. Most respondents were in their 20s (n= 127). Moreover, most of them had M.S. or PhD degrees (n= 114). 83 of the respondents had more than 5 years experience of using banking services, 28 of the respondents had 3-5 years experience of using banking services and 79 of the respondents had 1-3 years experience of using banking services. 86 of the respondents had less than 1 year experience of using IB, 76 of the respondents had 1-3 years experience of IB and 28 of the respondents had more than 3 years experience of IB. The most popular types of IB services used by respondents were account balance, bill payment and money transfer.

Data Analysis

The data was analyzed using structural equation modeling (SEM) technique, supported by LISREL 8.54 software. "Covariance-based SEM applies second order derivatives, such as Maximum Likelihood (ML) functions to maximize parameter estimates" (Gefen, Straub, & Boudreau, 2000, p. 28). For analyzing the measurement model, we performed a confirmatory factor analysis using LISREL. Confirmatory factor analysis (CFA) statistically tests the ability of the hypothesized model to reproduce the sampled data (Nusair & Hua, 2009). The overall model fit was assessed using several goodness-of-fit indices. First, the ratio (χ^2 /degree of freedom) should be less than 3 (Gefen, Straub & Boudreau, 2000) χ^2 was 657.39 and degree of freedom was 470 thus the ratio of χ^2 to degree of freedom was 1.4. CFI, NFI, NNFI were within the recommended limits (more than 0.9) and RMSEA was 0.046. Only GFI and AGFI were slightly below their limit. For each construct the factor loading of all items were within the limit and most of them were more than 0.6. After analyzing the measurement model we used a SEM approach to test the hypotheses. LISREL solution is depicted in figure2. Summary of the results are presented in table 1.

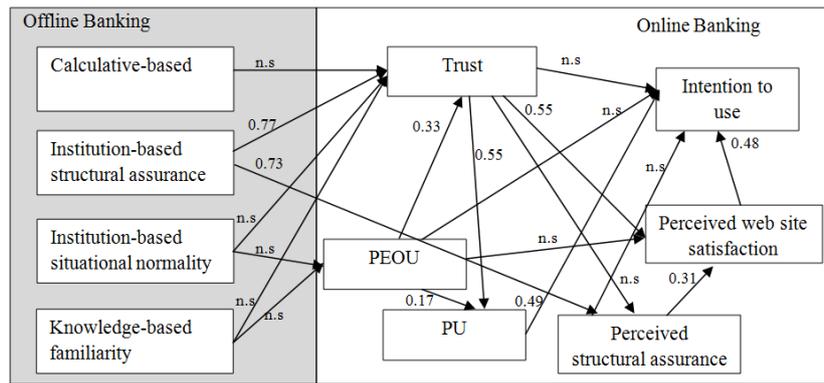


Figure2. Standardized LISREL solution

Based on the result of SEM, the hypotheses 1, 3,5,9,10,14,15,17,19 were supported while others were not. The results revealed that belief of customers about institution-based structural assurance has a positive effect on trust in online environment and perceived structural assurance; Perceived structural assurance and trust have positive effect on perceived satisfaction. Similar to Trust-TAM model the hypotheses about the relations between PEOU, PU and Trust were supported, but according to the SEM result only perceived satisfaction and PU affect the Intention to use.

Table1. Summary of the analysis

Constructs	Measurement Items for Each construct	Factor loading	t-value	Average variance extracted	Cronbach Alpha
Trust	This Internet banking site keeps its promises and commitments	0.68	-	0.703	0.606
	This Internet banking site keeps customers' best interest in mind	0.54	6.18		
	This Internet banking site would do the job right even if not monitored	0.41	4.88		
PU	Using this Internet banking site enhances the productivity of my banking activities	0.7	-	0.817	0.792
	Using this Internet banking site makes it easier to do my banking activities	0.75	9.46		
	Using this Internet banking site enables me to accomplish banking activities more quickly	0.79	9.83		
	Using this Internet banking site improves my performance of banking activities	0.74	9.25		
	I find this Internet banking site useful for my banking activities	0.85	10.54		
PEOU	It is easy for me to learn how to utilize this Internet banking site	0.82	-	0.831	0.831
	It is easy to remember how to use this Internet banking site	0.73	10.30		
	My interaction with this Internet banking site is clear and understandable	0.79	11.29		
	I find this Internet banking site easy to use	0.75	10.65		
Calculative-based	If the offline bank is honest in its interactions I believe that the online bank would act the same	0.7	9.41	0.739	0.736
	If the offline bank has nothing to gain by not caring about customers I believe that the online bank would act the same	0.83	11.27		
	If the offline bank is efficient I believe that the online bank would act the same	0.55	7.21		
Institution-based structural	Due to my experiences with the offline bank I believe that in online banking there are also guarantees that protect me.	0.54	7.36	0.799	0.609
	As the offline bank is well known I feel safe to work with its online branch	0.72	10.67		

assurance	Due to my experiences with the offline bank I feel that online bank is also trustworthy	0.77	11.71		
Knowledge-based familiarity	I became familiar with the online banking through magazines/newspapers and ads	0.34	4.09	0.739	0.618
	Familiarity with the offline branch urged me to use its online branch	0.74	9.36		
	Due to my experiences with the offline bank I feel more familiar with the online branch	0.69	8.79		
Institution-based situational normality	I feel that online banking has a similar process to offline banking	0.73	9.96	0.855	0.715
	For using the online bank I need similar information to those that I use for using offline banking services	0.62	8.19		
	Interactions with online bank is similar to interaction with offline bank	0.60	8.01		
Perceived structural assurance	Online banking has enough safeguards to make me feel comfortable using it for my personal business	0.86	-	0.871	0.82
	I feel assured that the legal and technological structures of online banking adequately protect me from Internet problems	0.77	11.74		
	In general online banking is a robust and safe environment in which to transact business.	0.76	11.45		
Perceived satisfaction	I feel satisfied with the information quality offered by the online bank	0.75	-	0.857	0.733
	I feel satisfied with the system quality of online bank	0.79	10.45		
	After using online banking I feel very satisfied	0.81	10.65		
Intention to use	I feel that offline banking is useful like online banking	0.34	-	0.803	0.821
	I recommend others to use online banking	0.89	4.55		
	In the future I intend to use online banking again	0.85	4.54		

Conclusions

Many researchers have developed different models based on TAM (Davis, 1989; Davis et al, 1989) for investigating new technology acceptance. In this study, we developed a model based on Trust-TAM (Gefen, Karahanna, & Straub, 2003) and model of Trust-Transfer (Lee, Kang, & McKnight, 2007). Trust-TAM posits that four elements, calculative based, institution-based structural assurance, institution-based situational normality and knowledge-based familiarity in online environment affect online trust. We studied these elements in offline environment and posited that they have positive effect on trust in IB. We also used two variables, perceived website satisfaction and perceived structural assurance from Trust-Transfer (Lee, Kang, & McKnight, 2007) and posited that they have positive effect on intention to use of IB. To study our hypotheses, we employed a web-based survey to gather data and gathered 190 valid responses. Structural Equation Modeling was used for data analysis. The result revealed that beliefs about institution based structural assurance in offline have positive effect on customers' trust and also perceived structural assurance in IB. The result also revealed that perceived usefulness and perceived satisfaction have positive effect on customers' intention to use. As trust and perceived structural assurance have positive effect on perceived satisfaction, banks need to adopt strategies that increase customers' trust and assure them about their security in order to increase IB usage.

Managerial Implication

In this study we developed a new model for Internet banking acceptance. The result of this study can help banking sector to develop successful strategies to increase usage of IB. This study reveals that perceived usefulness and perceived satisfaction have positive effect on IB usage. According to these results, perceived usefulness is influenced by perceived ease of use and trust; perceived satisfaction is influenced by perceived structural assurance and trust.

Therefore, trust, perceived ease of use and perceived structural assurance indirectly affect IB usage. There are several factors that affect perceived ease of use, perceived structural assurance and trust. Developing and designing banking web site are critical for increasing perceived ease of use. For IB users, perceived ease of use can be determined by several factors, for example, interface characteristics, terminology, screen design and navigation can affect perceived usefulness (Ramayah, 2006). Design of the process of using IB services is critical. The process should be clear and easy. Easy process will lead the customers to think that the process is useful and this will prompt them to use it again. An easy process especially for ordinary people will increase their satisfaction which will result in continuous usage. Moreover, adequate regulations and guarantees in offline environment will assure users that banks provide the same regulations in online as well. This will increase users' trust in IB. Customers' trust in IB is an important determinant which can encourage the customers to continuous usage of IB. Therefore, banks need to consider trust-building strategies, for example, through increasing regulations and guarantees, to assure banking customers about their security and encourage them to use new channels of service delivery.

References

- Gefen, D., Karahanna, E., & Straub, D. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27, 51-90.
- Lee, K., Kang, I., McKnight, H. (2007). Transfer from offline trust to key online perceptions: An Empirical study. *IEEE Transactions on Engineering Management*, 54(4), 729-741.
- Davis, F. D., Bagozzi, R. P. & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35, 982-1003.
- Klopping, M., & McKinney, E. (2004). Extending the technology acceptance model and the task-technology fit model to consumer e-commerce. *Information Technology, Learning, and Performance Journal*, 22, 35-48.
- Suh, B., Han, I. (2002). Effect of trust on customer acceptance of internet banking. *Electronic Commerce Research and Applications*, 1, 247-263.
- Palvia, P. (2009). The role of trust in e-commerce relational exchange: A unified model. *Information & Management*, 46, 213-220.
- Doney, P., & Cannon, J. (1997). An examination of the nature of trust in buyer-seller relationship. *Journal of Marketing*, 61, 35-51.
- Moorman, C., Deshpandé, R. & Zaltman, G. (1993). Factors Affecting Trust in Market Research Relationships. *Journal of Marketing*, 57, 81-101.
- Gefen, D. (2000). E-commerce: the role of familiarity and trust. *Omega*, 28, 725-737.
- Flavian, C., Guinalú, M. & Torres, E. (2006). How bricks-and-mortar attributes affect online banking adoption. *International Journal of Bank Marketing*, 24, 406-423.
- Pikkarainen, T., Pikkarainen, K., Karjaluoto, H. & Pahlila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research*, 14, 224-235.
- Gefen, D., Straub, D., & Boudreau, M. (2000). Structural equation modeling techniques and regression: Guidelines. *Communications of AIS Volume*, 7, 1- 79.
- Nusair, K., & Hua, N. (2009). Comparative assessment of structural equation modeling and multiple regression research methodologies: E-commerce context. *Tourism Management*, 1-11.

Ramayah, T. (2006). Interface characteristics, perceived ease of use and intention to use an online library in Malaysia. *Information development*, 22, 123-133.