

Amini, Mohammad Taqi; Ahmadinejad, Mustafa; Azizi, Mohammad Javad

Article

Adoption of Internet banking by Iranian customer: An empirical investigation

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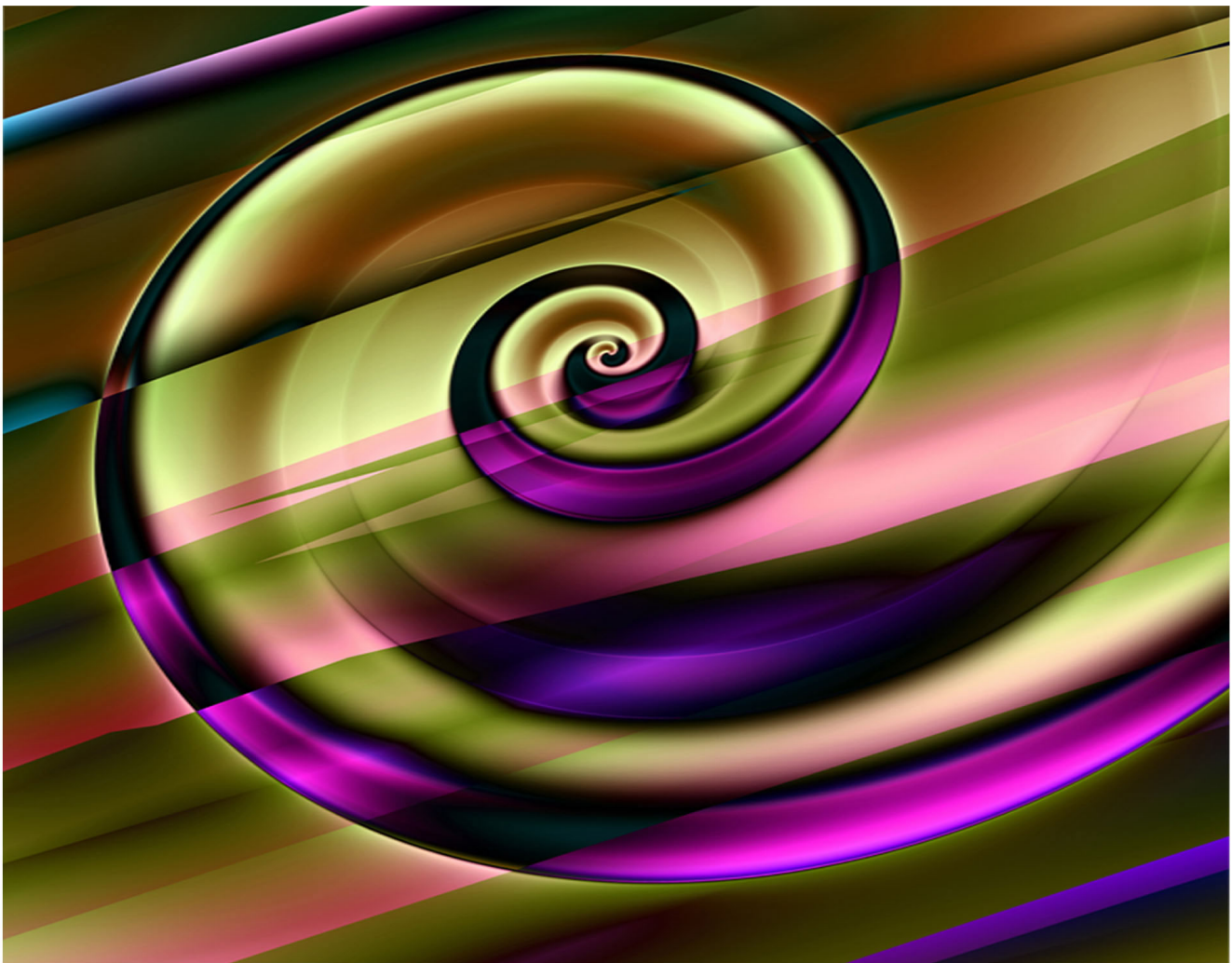
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ADOPTION OF INTERNET BANKING BY IRANIAN CUSTOMER: AN EMPIRICAL INVESTIGATION

MOHAMMAD TAQI AMINI

Associate Professor, Department of Business Management, Payame Noor University, Tehran, Iran

MUSTAFA AHMADINEJAD¹

PhD Candidate in Business Management, Payame Noor University, Tehran, Iran

MOHAMMAD JAVAD AZIZI

PhD Candidate in Commerce (E-banking), Pune University, Maharashtra, India

¹ Corresponding author: E- [mail: Ahmadinejad@phd.pnu.ac.ir](mailto:Ahmadinejad@phd.pnu.ac.ir), Tel:(++98) 912 638 0493

ABSTRACT

The purpose of this article is to provide an insight into the determinants of customers' Internet banking (IB) acceptance. Therefore, it attempts to address a research need for extending the technology acceptance model (TAM) by adding contextual factors for IB case. The data presented in this study are based on 202 questionnaires collected from individual Internet banking users in Iran. By using Confirmatory factor analysis, Pearson correlation testing, and multiple regressions, tested the correlations between variables. The findings of the study indicate that perceived usefulness and Computer self efficacy were the main factors influencing Internet banking acceptance. Recommend to banks managers to learning customer how to use computer and Internet banking and advertising about Internet banking benefit and its advantages. And with regard to importance of Computer self-efficacy, banks can promotion of customer ability about work with computer by proper advertising.

KeyWords

Internet Banking, Intention to use, Perceived Usefulness, Perceived ease of use, Perceived risk

INTRODUCTION

A growing phenomenon in financial services is the use of the Internet as a channel for financial services. The Internet bank usage might however not be easy for the consumers (Eriksson, Kerem, & Nilsson, 2005). Consumers' use of Internet banking requires acceptance of the technology, which can be complicated because it involves changes behavioral patterns (Meuter, Ostron, Roundtree, & Bitner, 2000). In recent years, developments in information technology and the resulting evolution of Internet banking have fundamentally changed the ways in which banks carry out their business and consumers conduct their everyday banking activities (Eriksson, Kerem, & Nilsson, 2008; Sayar & Wolfe, 2007). One advantage of banks going online is the potential savings in the cost of maintaining a traditional branch network (Shih & Fang, 2004). Internet banking allows customers to conduct a wide range of banking transactions electronically by the bank's web site – anytime and anywhere, faster, and with lower fees compared to using traditional, real-world bank branches (Krauter & Faullant, 2008). However, despite the continuing increase in the number of Internet users and despite all the apparent advantages of Internet banking for customers, in many countries the growth rate of Internet users who adopt Internet

banking has not risen as strongly as expected (White and Nteli, 2004). Unfortunately, given these advantages, customers of financial institutions have not embraced Internet banking (Abushanab & Pearson, 2007). Like other innovations, Internet banking faces many obstacles associated with its adoption. Since the success or failure of this technology will depend on the rate at which it is adopted, there is a need to discover which causes influence customers to adopt Internet banking. Identifying affective on customer intention to use of Internet banking services will help banks to have a proper reaction and developing marketing strategies to promotion of Internet banking. Out coming of Iran's entry into the World Trade Organization (WTO), foreign banks will enter the domestic market and bring with them the advantages of capital and financial innovation. Therefore banks should adopt their services offering with global technology changes and offer services based international bank industry standard. In developing country, usually banks imitation of offered services by banks in developed country and because of not doing needed research and investigation, offer this services weakly to the customers.

Internet Banking

Internet banking refers to providing electronic banking services via the Internet, commonly through a personal computer (PC) or other access devices with Internet capabilities (Gkoutzinis, 2008). Internet banking services were first provided in the early 1980s by Nottingham Building Society and the Bank of Scotland (Tait & Davis, 1989). However, these services were soon discontinued as it was not widely accepted by the banks' customers. In the early 1990s, with the rapid growth of information technology and electronic services, banks began to launch Internet banking services again (Daniel, 1998). In late 1990s many anticipated that Internet banking services, such as viewing banking transactions, bill payments and even online loan applications would become industry standards. These expectations were realized in a much shorter time than expected (Jenkins, 2007). However, despite the continuing increase in the number of Internet users and despite all the apparent advantages of Internet banking for customers, in many countries the growth rate of Internet users who adopt Internet banking has not risen as strongly as expected (White and Nteli, 2004). Across Europe, Internet banking adoption rates are markedly different. For example, in Norway and Finland 70-80 percent of Internet users adopt online banking, in Austria and Germany about 40 percent, whereas in Greece and Romania less than 10 percent of the Internet users make use of online banking or brokerage (Meyer, 2006). On the other hand, in Brazil the Internet banking growth rate over the past years has exceeded that of the Internet itself (Hernandez & Mazzon, 2007).

Model

One of the most used models in studying information system acceptance is the technology acceptance model (TAM) (Al-Gahtani, 2001; Davis & Venkatesh, 1996; Davis, Bagozzi & Warshaw, 1989; Gefen & Straub, 2000). The theoretical grounding for this research derives from TAM. TAM, proposed by Davis (1989) to explain and predict end-user acceptance of information systems (IS) has been confirmed across a broad range of Research settings on different information technology (IT) applications overtime. TAM is an extension of the Theory of Reasoned Action (TRA), developed by Fishbein and Ajzen (1977) to describe the psychological determinants of behavior. According to TRA, an individual's performance of a specific behavior is determined by his or her behavioral intentions (B I), which are a function of individual attitudes (ATT) (the person's feelings that performing the behavior is good or bad) and subjective norms (the person's beliefs that certain individuals or groups approve or disapprove of performing the behavior) (Fishbein & Ajzen, 1975). Based on TRA, TAM assumes that two personal beliefs about the ease of use (PEOU) and usefulness (PU) of the computer system influence ATT, which in turn lead to BI and then form behavior to use the system (Davis, Bagozzi & Warshaw, 1992; Venkatesh & Davis, 1996).

Perceived usefulness (PU) and perceived ease of use (PEOU)

Within TAM, PU is the major factor having a direct effect on BI, determining a proportion of ATT and mediating the effects of PEOU on BI. PEOU, however, is the secondary factor, having a direct influence only on ATT towards system use (Karahanna & Straub, 1999). PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). According to TAM, PEOU is a major factor that affects acceptance of information system (Davis, Bagozzi & Warshow, 1989). PEOU is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989). So an application perceived to be easier to use than another is more likely to be accepted by users. A significant body of research provides empirical support to show that PU and PEOU play a critical role in predicting and determining the usage behavior in technology acceptance situations (Horton, Buck, Waterson, & Clegg, 2001; Karahanna & Straub, 1999; Moon & Kim, 2001; Teo, Lim & Lai, 1999; Venkatesh, Morris, Davis & Davis, 2003 ;Venkatesh & Davis, 2000).

Perceived Risk

The concept of consumer-perceived risk has been widely dealt with in the marketing literature and has been shown to influence consumer behavior to varying degrees and in varying contexts (Cunningham, Gerlach, & Harper, 2005; Mitchell, 1998). Several researchers have added perceived risk to the set of factors important to adoption (Hansen, 2005; Polatoglu & Ekin, 2001; Tan & Teo, 2000). Consumer behavior researchers most often define perceived risk in terms of the consumer's perceptions of the uncertainty and potential adverse consequences of buying a product or service (Littler & Melanthiou, 2006). In the context of Internet banking, perceived risk refers to the security and reliability of transactions over the Internet. Several researchers have added perceived risk to the set of factors important to adoption (Hansen, 2005; Polatoglu & Ekin, 2001; Tan & Teo, 2000). Consumers' perceptions of risk are considered to influence their evaluations, choices and behavior strongly (Campbell & Goodstein, 2001). Lack of security and possible privacy concerns have been recognized as major obstacles to adoption. For example, Howcroft, Hamilton & Hewer (2002) have found security concerns to be the major factor discouraging the adoption of electronic banking services. De Ruyter, Wetzels, & Kleijnen (2001) have argued that perceived risk, as a critical attribute, is particularly applicable to services where it is not possible to derive quality cues from tangible aspects. Perceived risk increases with higher levels of uncertainty or with an increased chance of negative consequences (Campbell & Goodstein, 2001).

Computer self-efficacy

In general, prior research has suggested a positive relationship between experience with computing technology and a variety of outcomes such as an affect towards computers and computer usage (Agarwal & Prasad, 1999; Harrison & Rainer, 1992; Levin & Gordon, 1989; Wang, Wang, Lin & Tang, 2003). A related construct, called computer self-efficacy, has been examined in the IS literature (e.g. Compeau, Higgins & Huff, 1999; Hong, Thong, Wong & Tam, 2001). Computer self-efficacy is defined as the judgment of one's ability to use a computer (Compeau & Higgins, 1995). Continuing research efforts on computer self-efficacy can be observed in recent IS studies (Agarwal, Sambamurthy & Stair, 2000; Johnson & Marakas, 2000; Hong & et al., 2001; Chau, 2001), which confirm the critical role that computer self-efficacy plays in understanding individual responses to information technology.

Availability of access to Internet and Quality of Internet connection

Availability of access to computers/ Internet is a prerequisite for adoption of Internet banking. The more widespread the access to computers/Internet, the greater the possibility of use of Internet

banking. O'connell (1996) and Sathy (1999) in Australia, Daniel (1999) in the UK & Ireland, Gerrard, Cunningham and Devlin (2006) in a qualitative research in Singapore found lack of customer access to suitable PCs as the reason for low usage of electronic banking. On the other hand, without a proper Internet connection the use of online banking is not possible. Pikkarainen, Pikkarainen, Karjaluoto & Pahnla (2004) identified quality of Internet connection is affective on Internet banking adoption. According to Internet World Stats (2009), Iran has 23 million Internet user and only 2 percent of user's access to high speed Internet. Regard to situation of Internet penetration in Iran we suggest "access to Internet" and "quality of Internet" as affective to intention to use of Internet banking. (Summary of some pervious research about Internet banking adoption shown in table 1)

Hypotheses

H1. Perceived usefulness (PU) has a positive effect on customer intention to use Internet banking services

H2. Perceived ease of use (PEOU) has a positive effect on customer intention to use Internet banking services

H3. Perceived risk have a positive effect on customer intention to use Internet banking services

H4. Computer self-efficacy has a positive effect on customer intention to use Internet banking services

H5. Availability of access to Internet has a positive effect on customer intention to use Internet banking services

H6. Quality of Internet connection has a positive effect on customer intention to use Internet banking services



RESEARCH DESIGN AND METHOD

Data collection

Data for this study was collected by the means of a survey conducted in Iran in September 2009. A total of 250 questionnaire forms were delivered to respondents of which 202 were returned giving a response rate of 81 percent. By consulting with banking experts, divided Tehran City to five geographic North, South, East, West and Central region and based on amount of bank's branch customer and variety of services that bank's branch offer in per region selected one branch as a sample and distributed questionnaire there. Therefore, sampling method in this study is judgment sampling.

Measures of the constructs

To ensure the content validity of the scales, the items selected must represent the concept about which generalizations are to be made (Bohmstedt, 1970). Therefore, items selected for the constructs were mainly adapted from prior studies to ensure content validity. One advantage of using the TAM to examine Internet banking acceptance is that it has a well-validated measurement inventory (Davis, 1989; Doll, Hendrickson & Deng, 1998). Items for the perceived ease of use and perceived usefulness were taken from the previous validated inventory and modified to fit the specific technology studies. The items to measure behavioral intention were taken from previous applications of TAM (Agarwal & Prasad, 1999; Venkatesh & Davis, 1996). Three items for the computer self-efficacy construct were adapted from the original instrument of computer self-efficacy developed by Compeau and Higgins (1995). Three items for Perceived risk were taken from previous study by Krauter and Faullant (2008). The items to measure availability of access to Internet were taken from study by Sathye (1999) and Finally, Quality of Internet connection was measured by two statements taken from study by Pikkarainen & et al. (2004). Likert scales (1-5), with anchors ranging from "strongly disagree" to "strongly agree" were used for all questions except for the items measuring computer self-efficacy. The anchors of the items measuring computer self-efficacy ranged from "Not at all confident" to "Totally confident."

Analysis Methods

The response to the questionnaires was captured electronically into SPSS for preliminary data analysis, and more detailed statistical analyses. Descriptive Analysis was used to examine the TAM Variables. ANOVA was used to determine the differences in perceptions of customer on TAM. To test whether measures of factors are consistent with our understanding of the nature, we use Confirmatory

factor analysis (CFA). CFA is a special form of factor analysis that's appropriate in situations where the dimensionality of a set of variables for a given population is already known because of previous research. Pearson correlation coefficient was used to determine the degree of relationships between TAM variables. Multiple Regressions was used to predict intention to use. Multiple regression is a flexible method of data analysis that may be appropriate whenever a quantitative variable (the dependent or criterion variable) is to be examined in relationship to any other factors (expressed as independent or predictor variables).

Result

The gender breakdown was 69 percent male and 31 percent female; the average age of respondents was 30 years. Approximately half of the respondents belonged to the low income level (between 2-5 million Rls, per month).

Factor analysis

A confirmatory factor analysis was conducted on the items comprising PU, PEOU, Perceived risk, Computer self-efficacy, Availability of access to Internet and the quality of online connection. The factor analysis was conducted using principal axis factoring with varimax rotation as an extraction method (see for details, e.g. Nummenmaa et al., 1996, p. 244; Aczel, 1999, pp. 814-18; Hair et al., 1998, pp. 87-120). Two variables from the original variable list did not fit into the factor model. One of the excluded variables was associated with quality of Internet connection and one with PEOU. The six factors identified were chosen in terms of eigenvalue larger than 1.0. The Bartlett's test of sphericity confirmed that the variables within factors are correlated. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy indicated a practical level of common variance (KMO = 0.713). Thereby, the factor analysis was appropriate. The identified factors (Table 2) represent 71.7 percent of the variance of the variables. The first factor, PU, consists of five variables ($\alpha = 0.85$). Peterson (1994) points that acceptable value of Cronbach's α can vary between 0.5 and 0.95 depending on the type of research. For basic research Cronbach's α should be higher than 0.7-0.8. The second factor, PEOU, was loaded with four variables ($\alpha = 0.83$). The third factor, Quality of Internet connection, contained three variables ($\alpha = 0.76$). The fourth factor exhibits loadings for three variables referring to Perceived risk, ($\alpha = 0.78$). Computer self-efficacy was loaded with two variables ($\alpha = 0.80$). The overall reliability of the factor analysis was 0.82. The first factor, PU explained most of the total variance (18.20 percent). The results of the factor analysis are presented in Table 2.

Regression analysis

This factor model was then used to analyse the intention to use Internet banking. The regression analysis was conducted to reveal how different factors affect the intention to use of Internet banking. A multi-correlation problem was identified and minimized using the statistical choice methods (Nummenmaa et al., 1996). Although of the explanatory variables and their coefficients only Perceived Usefulness ($t = 5.42$, $p < 0.01$) and Computer self efficacy ($t = 2.56$, $p < 0.05$) are statistically significant, the overall model was statistically significant ($R^2 = 0.39$, $p < 0.01$). Quality of Internet ($t = 1.95$, $p < 0.052$) and Perceived risk ($t = 1.82$, $p < 0.07$) are almost significant with the five percent level. The results of the regression analysis are presented in Table 3.

Correlation analysis

We finally run a correlation analysis to further test our hypotheses. The results indicate that Perceived ease of use, Perceived Usefulness, Perceived risk, Availability of access to Internet and Quality of Internet are positively correlated with intention to use in the one percent level. And Computer Self Efficacy is positively correlated with intention to use in the five percent level. From background variables Age was negatively correlated with intention to use; Younger customers have more interest to use Internet banking. And between gender and intention to use was correlated; males have more interest to use Internet banking rather than female. Correlations of all factors and background variables with intention to use Internet banking are displayed in Table 4.

In sum, PU, PEU, Perceived risk, CSE, Quality of Internet and Access to Internet have a positive effect on the intention to use of Internet banking. Also the Age and Gender have effect. Based on our data analysis, PU, PEU, Perceived risk, CSE, Quality of Internet and Access to Internet statistically significantly affect the intention to use. Background variables age and gender are also statistically significant. This means that all of hypotheses were supported in this study.

Summary and conclusions

The primary objective of the study was to study consumer acceptance of Internet banking in Iran in the light of the technology acceptance model (TAM) added with new variables derived from Internet banking acceptance literature on one hand and from study situation of Internet in Iran on the other. The model we developed proposed that Internet banking acceptance can be modeled with the variables derived from the TAM (PU, PEOU, CSE) and three other variables referring to perceived risk, availability of access to Internet, and the quality of the Internet connection. In the results section the model was tested with 202 Finnish consumers and revised. With the use of a factor analysis, six factors were identified suggesting that PU, PEOU, CSE, perceived risk, availability of access to Internet and the

quality of the Internet connection have an impact on the acceptance of Internet banking. The results of the regression analysis conducted on the six factors indicate that PU and computer self-efficacy were found to be the most influential factors explaining the intention to use of Internet banking services. This finding refers to the fact that consumers use Internet banking for the benefits it provides in comparison to other banking delivery channels. This finding is in line with other TAM studies (e.g. Celik, 2008; Davis, 1989; Davis et al., 1989; Eriksson et al., 2005; Pikkarainen et al., 2004), which found that PEOU has less impact on technology acceptance than PU. This is explained with the fact that as users learn about PEOU, its impact becomes instrumental. In other words, PEOU impinges on acceptance through PU. As suggested by Suh and Han (2002), the indirect effects of PEOU via PU on attitudes toward using and intentions to use Internet banking were also confirmed. The second influential factor indicates that while consumers getting more ability about use computer and Internet they become more intended to use Internet banking. Wang et al. (2003) demonstrated the significant effect of computer self-efficacy on behavioral intention through perceived ease of use, perceived usefulness, and perceived credibility.

Perceived risk and quality of Internet were almost statistically significant variables in the model. Some studies about Internet banking adoption, found perceived risk as an affective factor (e.g. Gerrard, Cunningham & Devlin, 2006; Krauter & Faillant, 2008; Sathy, 1999; Singh, 2004). Pikkarainen et al., (2004), proposed Quality of Internet as an affective factor on online banking, but results show that it isn't fit into their proposed model.

In this study, result shows that quality of Internet is almost statistically significant variables in the model. Regard to situation of Internet penetration in Iran, we expected quality of Internet have a significant influence on intention to use Internet banking.

Recommendations

The results of the study indicate that the main reason of Internet banking usage laid on its benefits that this channel provides in compare to other service delivery channels. Hence, it has been recommended to bank's managers to arrange a learning program for customers and advertise about Internet banking benefits and advantages. Also, marketing experts should emphasize benefits that the adoption of this new way services in banking industries provide for its users. And with regard to the importance of computer self-efficacy, banks can improve customer's skill on computer usage by proper advertising

Limits and further research

The limits of this study are four-fold. First, the study findings and implications presented here were obtained from a single study using a snapshot research approach. This reduces the ability of this study

to reflect the temporal changes in the research constructs, especially when Internet banking experiences increase. Thus, future research about this subject matter should be of a longitudinal nature to clarify the effects of temporal changes. Second, the intention of the research participants to use Internet banking was measured through self-reports in this study. Although some prior studies on technology acceptance provide evidence about the strong correlation between self-reports and actual system usage (e.g. Taylor and Todd, 1995), future research efforts should be conducted to validate usage externally. The other limitation of this work concerns the measures for user acceptance. TAM studies have found that PU and PEOU are not the only predictors of technology acceptance. Legris et al. (2003) found that many TAM studies are not consistent or clear and lack many significant factors that influence adoption. Partly on this basis, the original TAM has been extended for example by Venkatesh and Davis (2000) who introduced the second version of TAM, labeled TAM2 to explain how subjective norms and cognitive instrumental processes affect perceived usefulness and intentions (see also Venkatesh and Morris, 2000). On this basis, our model might also suffer from the fact that for example subjective norms, Social influence, Perceived enjoyment, Amount information about Internet banking, Price, and other possible factors influencing the acceptance of Internet banking were not included in the model. Finally, since the sample size in the present study is relatively small, the generalizability of the study results to a more general Iranian Internet banking customer segment may be somewhat limited.

REFERENCES

1. AbuShanab, E., & Pearson, J.M. (2007). Internet banking in Jordan The unified theory of acceptance and use of technology (UTAUT) perspective. *Journal of Systems and Information Technology*, 9, 78-97.
2. Agarwal, R., & Prasad, J. (1999). Are individual differences germane to the acceptance of new information technologies?. *Decision Sciences*, 30, 361-91.
3. Agarwal, R., Sambamurthy, V., & Stair, R.M. (2000). Research report: the evolving relationship between general and specific computer self-efficacy – an empirical assessment. *Information Systems Research*, 11, 418-30.
4. Bohmstedt, G.W. (1970). Reliability and validity assessment in attitude measurement. in Summers, G.F. (Ed.), *Attitude Measurement*, Rand-McNally, Chicago, 80-99.
5. Campbell, M.C., & Goodstein, R.C. (2001). The moderating effect of perceived risk on consumers' evaluations of product incongruity: preference for the norm. *Journal of Consumer Research*, 28, 43 9-49.
6. Chau, P.Y.K. (2001). Influence of computer attitude and self-efficacy on IT usage behavior.

- Journal of End User Computing*, 13, 26-33.
7. Clik, H., (2008). What determines Turkish customers' acceptance of Internet banking. *International Journal of Bank Marketing*, 26, 353-370.
 8. Compeau, D.R., Higgins, C.A., & Huff, S. (1999). Social cognitive theory and individual reactions to computing technology: a longitudinal study. *MIS Quarterly*, 23, 145-58.
 9. Cunningham, L.F., Gerlach, J., & Harper, M.D. (2005). Perceived risk and e-banking services: an analysis from the perspective of the consumer. *Journal of Financial Services Marketing*, 10, 165-78.
 10. Daniel, E. (1998). Online banking: winning the majority. *Journal of Financial Services Marketing*, 2, 259-70.
 11. Daniel, E. (1999). Provision of electronic banking in the UK and the Republic of Ireland. *International Journal of Bank Marketing*, 17, 72-83.
 12. Davis, F.D. (1989). Perceived usefulness, perceived easy of use, and user acceptance of information technology. *MIS Quarterly*, September, 319-40.
 13. Davis, F.D., & Venkatesh, V. (1996). A critical assessment of potential measurement biases in the technology acceptance model: three experiments. *International Journal of Human-Computer Studies*, 45, 19-45.
 14. 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.
 15. Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, 22, 1111-32.
 16. Davis, F.D., Bagozzi, R.P., & Warshaw P.R. (1989). user acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35, 982-113
 17. De Ruyter, K., Wetzels, M., & Kleijnen, M. (2001) Customer adoption of e-service: an experimental study. *International Journal of Service Industry Management*, 12, 184-207.
 18. Doll, W.J., Hendrickson, A, & Deng, X. (1998). Using Davis's perceived usefulness and ease-of-use instruments for decision making: a confirmatory and multi-group invariance analysis. *Decision Science*, 29, 839-69.
 19. Erikson, K., Kerem, K., & Nilsson, D. (2005). Customer acceptance of Internet banking in Estonia. *International Journal of Bank Marketing*, 23, 200-216.
 20. Eriksson, K., Kerem, K., & Nilsson, D. (2008). The adoption of commercial innovations in the former Central and Eastern European markets. *International Journal of Bank Marketing*, 26, 154-169.
 21. Fishbein, M., & Ajzen, I. (1977). Attitude-behavior relations: a theoretical analysis and review of empirical research. *Psychological Bulletin*, 84, 888-918.

22. Fishbein, M., & Ajzen, I., (1975). Belief, Attitude, Intention, and behavior: An Introduction to Theory and Research. *Addison-Wesley*, Reading, MA.
23. Gahtani, S. (2001). The applicability of TAM outside North America: an empirical test in the United Kingdom. *Information Resources Management Journal*, July- September, 37-46.
24. Gefen, D., & Straub, D. (2000). The relative importance of perceived ease of use in IS adoption: a study of e-commerce adoption. *Journal of the Association for Information Systems*, 1, 1-28.
25. Gerrard, P., Cunningham, J.B., & Devlin, J.F. (2006). Why consumer are not using Internet banking: a qualitative study. *Journal of services Marketing*, 20/3, 160-168
26. Gkoutzinis, A, (2008). Internet Banking and the low in Europe, Regulation, Financial Integration and Electronic Commerce. *Cambridge University Press*, 45-46
27. Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1998). Multivariate Data Analysis, 5th ed., Prentice-Hall, Upper Saddle River, NJ.
28. Hansen, T. (2005). Consumer adoption of online grocery buying: a discriminate analysis. *International Journal of Retail & Distribution Management*, 33, 101-21.
29. Harrison, A.W., & Rainer, R.K. J. (1992). The influence of individual differences on skill in end-user computing. *Journal of Management Information Systems*, 9, 93-111.
30. Hernandez, J.M.C., Mazzon, J.A. (2007). Adoption of Internet banking: proposition and implementation of an integrated methodology approach. *International Journal of Bank Marketing*, 25, 72-88.
31. Hong, W., Thong, J.Y.L., Wong, W.M., & Tam, K.Y. (2001). Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics. *Journal of Management Information Systems*, 18, 97-124.
32. Horton, R.P., Buck, T., Waterson, P.E., & Clegg, C.W. (2001). Explaining intranet use with the technology acceptance model. *Journal of Information Technology*, 16, 237-49.
33. Howcroft, B., Hamilton, R., & Hower, P. (2002). Consumer attitude and the usage and adoption of home-based banking in the United Kingdom. *The International Journal of Bank Marketing*, 20, 111-21.
34. Internet World Stats (2009), Available at www.Internetworldstats.com
35. Jaruwachirathanakul, J., & Fink, D. (2005). Internet banking adoption strategies for a developing country: the case of Thailand, *Internet Research*, 15, 295-311.
36. Jenkins H. (2007). Adopting Internet banking services in a small island state: assurance of bank services quality. *Managing Services Quality*, 17, 523-53.
37. Johnson, R.D., & Marakas, G.M. (2000). Research report: the role of behavior modeling in

- computer skills acquisition – toward refinement of the model. *Information Systems Research*, 11, 402-17.
38. Karahanna, E., & Straub, D.W. (1999). The psychological origins of perceived usefulness and ease of use. *Information and Management*, 35, 237-50.
 39. Krauter S. G., & Faullant R. (2008). Consumer acceptance of Internet banking: the influence of Internet trust. *International Journal of Bank Marketing*, 26, 483-504.
 40. Legris, P., Ingham, J., & Colletette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40, 191-204.
 41. Levin, T., & Gordon, C. (1989). Effect of gender and computer experience on attitudes towards computers. *Journal of Educational Computing Research*, 5, 69-88.
 42. Littler, D., & Melanthiou, D. (2006). Consumer perceptions of risk and uncertainty and the implications for behavior towards innovative retail services: the case of Internet banking. *Journal of Retailing and Consumer Services*, 13, 431-43.
 43. Meuter, M.L., Ostron, A.L., Roundtree, R.I., & Bitner, M.J. (2000). Self-service technologies: understanding customer satisfaction with technology-based service encounters. *Journal of Marketing*, 64, 50-64.
 44. Meyer, T. (2006). Online banking. What we learn from differences in Europe. In Deutsche Bank Research (Ed.), *E-Banking Snapshot*, Deutsche Bank Research, Frankfurt am Main.
 45. Mitchell, V.W. (1999). Consumer perceived risk: conceptualization and models. *European Journal of Marketing*, 33, 163-95.
 46. Moon, J.W., Kim, Y.G. (2001). Extending the TAM for a World Wide Web context. *Information & Management*, 38, 2 17-230.
 47. Nummenmaa, T., Konttinen, R., Kuusinen, J., & Leskinen, E. (1996), Tutkimusaineiston Analyysi (Analysis of Research Data), WSOY, Helsinki.
 48. O'Connell, B. (1996). Australian banking on the Internet – fact or fiction. *The Australian Banker*, December, 2 12-14
 49. Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnla, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research*, 14, 224-23 5
 50. Polatoglu, V.N., & Ekin, S. (2001). An empirical investigation of the Turkish consumers' acceptance of Internet banking services. *International Journal of Bank Marketing*, 19, 156-65.
 51. Sathye M. (1999). Adoption of Internet banking by Australian consumers: an empirical investigation. *International Journal of Bank Marketing*, 17, 324-3 34.
 52. Sayar, C., & Wolfe, S. (2007). Internet banking market performance: Turkey versus the UK. *International Journal of Bank Marketing*, 25, 122-41.

53. Shih, Y., & Fang, K. (2004). The use of a decomposed theory of planned behavior to study Internet banking in Taiwan. *Internet Research*, 14, 213-223
54. Singh, A.M. (2004). Trends in South African Internet banking. *Aslib Proceeding: new Information perspectives*, 56, 187-196.
55. Suh, B., & Han, I. (2003). The impact of customer trust and perception of security control on the acceptance of electronic commerce. *International Journal of Electronic Commerce*, 7, 135-61.
56. Tait, F., & Davis, R.H. (1989). The development and future of home banking. *International Journal of Bank Marketing*, 7, 3-9.
57. Tan, M., & Teo, T.S.H. (2000). Factors influencing the adoption of Internet banking. *Journal of the Association for Information Systems*, 1, 1-42.
58. Taylor, S., & Todd, P.A. (1995). Understanding information technology usage: a test of competing models. *Information Systems Research*, 6, 144-76.
59. Teo, T.S.H., Lim, V.K.G., & Lai, R.Y.C. (1999). Intrinsic and extrinsic motivation in Internet usage. Omega, *International Journal of Management Science*, 27, 25-37.
60. Venkatesh, V., & Davis, F.D. (1996). A model of the antecedents of perceived ease of use: development and test. *Decision Sciences*, 27, 451-81.
61. Venkatesh, V., & Davis, F.D. (2000). Theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science*, 46, 186-204.
62. Venkatesh, V., & Morris, M.G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, 24, 115-39.
63. Wang, Y.I., Wang, Y.U., Lin, H., & Tang, T. (2003). Determinants of user acceptance of Internet banking: An empirical study. *International Journal of Service Industry Management*, 14, 501-519.
64. White, H., & Nteli, F. (2004). Internet banking in the UK: why are there not more customers?. *Journal of Financial Services Marketing*, 9, 49-56.

Table 1: Summary of some pervious research about Internet banking

	Study	Year	sample	results
1	Sathy	1999	Australia	security concerns and lack of awareness about Internet banking and its benefits stand out as being the obstacles to the adoption of Internet banking in Australia.
2	Wang, et al.	2003	Taiwan	the results strongly support the extended TAM in predicting the intention of users to adopt Internet banking. It also demonstrates the significant effect of computer self-efficacy on behavioral intention through perceived ease of use, perceived usefulness, and perceived credibility.
3	Pikkarainen, et al.	2004	Finland	The findings of the study indicate that perceived usefulness and information on online banking on the Web site were the main factors influencing online-banking acceptance.
4	Shih and Fang	2004	Taiwan	Results generally support TRA and TPB and provide a good fit to the data.
5	Singh	2004	South Africa	Potential customers wanted guaranteed safety and loyalty rewards to get them to bank online. Internet banking has the potential to grow amongst tertiary institution employees.
6	Eriksson, et al	2005	Estonia	The perceived usefulness is central because it determines whether the perceived ease of Internet bank use will lead to increased use of the Internet bank. Put differently, a well-designed and easy to use Internet bank may not be used if it is not perceived as useful.
7	Jaruwachirathanakul and Fink	2005	Thailand	The attitudinal factors that appear to encourage the adoption of Internet banking in Thailand most are "Features of the web site" and "Perceived usefulness", while the most significant impediment to adoption is a perceived behavioral control, namely "External environment".
8	Gerrard , et al.	2006	Singapore	Eight factors were identified which explain why consumers are not using Internet banking: perceptions about risk; the need; lacking knowledge; inertia; inaccessibility; human touch; pricing and IT fatigue.
9	AbuShanab, and Pearson	2007	Jordan	Performance expectancy, effort expectancy, and social influence have significant and explained a significant amount of the variance in predicting a customer's intention to adopt Internet banking.
10	Hernandez and Mazzon	2007	Brazil	Variables that influence the intention to use/continue to use IB are not exactly the same as those that influence actual adoption. Specifically, the results seem to suggest that intention to use IB is influenced solely by people's beliefs about IB, while its actual adoption is influenced also by individual characteristics.
11	Hakan Celik	2008	Turkey	The results indicate that perceived usefulness (PU) and perceived ease of use (PEOU) are immediate direct determinants of customers' attitudes towards using IB (ATT).

12	Grabner-Krauter and Faullant	2008	Austria	The results confirm the influence of Internet trust on risk perception and consumer attitudes towards Internet banking. Propensity to trust is a determinant not only for interpersonal relationships but also for trust in technological systems.
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Table 2: The factor analysis

Variable	Perceived usefulness	Perceived ease of use	Quality of Internet	Perceived risk	Computer self- efficacy	Access to Internet
Using an Internet banking enhances my effectiveness of utilizing banking services	799.0					
Using the Internet banking systems make it easier for me to conduct banking transactions.	799.0					
Using an Internet banking enables me to utilize banking services more quickly	777.0					
Using an Internet banking for my banking services increases my productivity	754.0					
Using an Internet banking improves my performance of utilizing banking services	736.0					
It is easy for me to become skillful at using an Internet banking		897.0				
I find it easy to do what I want to do in Internet banking		866.0				
My interaction with an Internet banking is clear and understandable		744.0				
Overall, I find an Internet banking easy to use		-				
Possibility connection to high speed/ quality Internet			854.0			
Suitable telecommunication infrastructure to fast and ensure data transfer			796.0			
Disorder or problem caused the connections lines when using Internet banking			-			
I am afraid that the confidentiality of my financial transactions might get lost when using Internet banking.				813.0		
I am afraid that other people might get access to information about my Internet banking transactions.				746.0		
I think that privacy is not guaranteed when using Internet banking.				714.0		
Using the Internet/computer is not complicated and can be learned easily					919.0	
I can conduct my banking transactions using the Internet banking systems.					0.908	

I have availability of access to Internet in my home/work						0.842
Eigenvalue	276.3	759.2	060.2	014.2	728.1	067.1
Percentage of total variance explained	200.18	325.15	445.11	187.11	602.9	928.5

Table 3: Regression analysis

Model Summary		R	R Square	Adjusted R	Std. Error of	
Model				Square	the Estimate	
ANOVA ^a		.626(a)	.392	.367	.911	
	Sum of Squares	df	Mean Square	F	Sig.	
Regression	77.942	6	12.990	15.622	.000 ^a	
Residual	121.404	146	.832			
Total	199.346	152				
Coefficients ^a	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
(Constant)	1.586	.699			2.267	.025
PEOU	.063	.039	.118		1.590	.114
PU	.167	.031	.407		5.428	.000
Perceived risk	.070	.038	.135		1.828	.070
Access to Internet	.000	.083	.000		-.009	.993
Quality of Internet	.066	.034	.139		1.956	.052
Computer self-efficacy	.099	.038	.170		2.565	.011

Notes: Predictors: (constant), perceived ease of use, perceived usefulness, perceived risk, access to Internet, quality of Internet, computer self efficacy. Dependent variable: intention to use IB

Table 4: Correlation analysis

Correlations		PEOU	PU	Perceived risk	Access to Internet	Quality of Internet	Computer self-efficacy	Intention to use IB	Age	Gender	Income
Intention to use IB	Pearson							1			
	Correlation	.278**	.521**	.453**	.326**	.263**	.162*		.201*	.376**	-.101
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.026		.020	.000	.155
	N	200	193	168	177	201	190	201	199	201	196

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