# Internet banking adoption: an empirical analysis in Tehran

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**Abstract:** This paper seeks to identify empirically the factors underlying the decision to adopt online banking in Tehran. The sample used in this study is based on 385 interactive questionnaires completed by Tehran internet users. Data were analyzed by employing correlation and multiple linear regression analysis. The results showed that perceived usefulness, perceived ease of use, trust and use of other banking products positively associated with the intention to use online banking in Tehran.This study was conducted in Tehran and future research can use this model to study the adoption of online banking in other cities. The results allow banks' decision makers to develop strategies that can increase the adoption of online banking. Banks should improve the security and privacy of the websites, which will increase the trust of users. Banks should also create features which are useful to users, try to make the process of using the services easy for consumers, teach customers how to use the online services and use a package deal, such as an account with online access, debit or credit card and a SMS banking service. The findings allow the factors that can influence the adoption of online banking in Tehran to be understood. Unlike existing studies based on Technology Acceptance Model (TAM), this study includes, trust and use of other banking products on top of the existing variables used in TAM. Most studies on adoption of online banking are focused on developed countries. By focusing on Iran, this model can also be applied to other countries which are relatively new to e-commerce and online banking.

**Keywords**:   adoption of Internet banking, trust, convenience and perceived usefulness, ,Tehran.

## Introduction

The application of internet technologies to businesses for improvements in their performances is not something new. As stated by Saffu et al. (2008), there is an increase in applications of          e-commerce in businesses in the past ten years. The benefits of e-commerce include reduction in cost, increasing business opportunities, reducing lead time and providing a more personalized service to the consumers (Turban et al., 2008). One e-commerce tool that is being adopted by the banking industry is online banking or e-banking. IT tools such as online banking have provided an improvement in services among the banking industry (Dawes and Rowley, 1998). There are currently more than thousands of e-banking web sites all over the world (Gurau, 2002). Although online banking has been implemented in many developed countries such as the United States and those in Europe (Pikkarainen et al., 2004), there is a growing trend in the adoption of online banking by banks in developing countries too (Gurau, 2002).

Despite all the aforementioned merits of internet banking, certain barriers to adopting it exist (Black et al., 2002; Karjaluoto et al., 2002; Lee et al., 2005; Gan et al., 2006). Among the variety of factors impeding the diffusion of this innovation,Trust is an important element affecting consumer behavior and it determines the success of technologies adoption such as e-commerce (Chen and Barnes, 2007;Holsapple and Sasidharan, 2005; Goles et al., 2009; Yang et al., 2009). In our study, trust is defined as the extent to which an individual believes that using online banking is secured and has no privacy threats.

Moreover, due to the advantages of Internet banking and high number of Internet users in Iran, Statistics indicate that the capacity of the Internet to deliver these services are not fully used, these statics suggest that less than 40% of bank card holders are doing Internet shopping and only 5/5% of bank customers use Internet services (Moradi et al., 1389). Banks have come to this conclusion that if customers reject modern banking technologies and services or not fully use the capacity, they will gain little income from their investments in these new technologies and services. (Yousafzai and Yani-de-Soriano., 2012)

Although there are past literatures studied on the adoption of online banking, many of these studies have tended to focus on European countries or the United States (Pikkarainen et al., 2004). However, Iran is different from these countries given that the economy is still expanding in recent years. Thus the adoption of online banking is still at its infancy when compared to other developed nations. Therefore, the primary objective of this research is to understand the consumers' perception towards the acceptance of internet banking in Iran and identifies the factors that can predict their intention to use in internet banking context. Given that there are many factors that can influence the usage of online banking,the result from this study will allow decision makers in banks to focus on the factors which will increase the adoption of online banking in Iran.

## Literature review

The objective of this study is to evaluate the phenomenon of online banking adoption from the perspective of Iranian internet users.

## Internet banking

Many organizations today have responded to the competitive business environment by implementing e-business as part of their business strategies. With the growth of the internet, it is inevitable for banks to move towards providing online banking for their customers. Although the current branch based retail banking remains the most common method for conducting banking transactions, internet technologies has changed the way personal financial services are designed and delivered to customers (Wang et al., 2003). Shih and Fang (2004) describe internet banking as a new type of information system that uses the innovative resources of the internet and WWW
(world wide web) to enable customers to effect financial activities in virtual space. For example, it allows customers to perform a wide range of banking transactions electronically via the bank's web site (Tan and Teo, 2000).

Early online banking web sites contained mainly product and service information for their customers. However, with the development of asynchronous and secured electronic transaction technologies, more banks are now using online banking both as a transactional as well as an informational medium. As a result, registered internet banking users can now perform common banking transactions such as writing cheques, paying bills, transferring funds, printing statements, setting up fixed deposits, purchasing investment related funds and enquiring about account balances (Yee-Loong Chong et al.,2010). Internet banking has evolved into a "one stop service and information unit" that promises great benefits to both banks and consumers (Tan and Teo, 2000).

Internet banking works the same way as the traditional banking services. The main difference is that customers are accessing their account and information, making payments and reconciling statements by using their computer rather than paper to complete the transactions. Internet banking services are crucial elements for the long-term survival of banks in the world of electronic commerce (Tan and Teo, 2000). The market for internet banking is forecasted to grow sharply in the next few years, affecting the competitive advantage enjoyed by traditional banks with physical branches (Duclaux, 1996; Liao et al., 1999).

Although online banking is common in many developed countries, for many developing countries, online banking is still very much at its infancy. This is especially true for countries, such as Iran, which are still building up their IT infrastructure. online banking is still unfamiliar to many Iranian users and is still at an early stage of development, but with an internet population of 47million users(Internet World Stats)[1] , there is a huge market potential for banks to explore.However, for any technologies to be successfully introduced and used, the users have to accept and adopt the technology. Although online banking adoption

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[1] - www.Internet World Stats.com

studies have been conducted in many developed and Western countries, studies for a developing and fast growing country such as Iran remain very few. Therefore this study attempts to investigates the factors that can influence users' acceptance of online banking in Iran.

**Technology adoption models**

To assess the adoption scenario of IT application in the market, such as internet banking, a lot of previous studies and research have carried out and various frameworks were proposed to identify the factors or determinants influencing the acceptance of technology in the consumer context. Since online banking is a type technological innovation (Lin and Lee, 2005), existing studies on innovation adoption could be used in the study of online banking. One of the most common models used by researchers in the study of individual's adoption of technology is Technology

Acceptance Model (TAM) (Davis, 1989). TAM proposed that both the perceived usefulness and perceived ease of use can be used to predict the attitude towards using new technology, which in turn affects the behavioral intention to use the actual system directly (Davis, 1989; Venkatesh et al., 2003).

Perceived usefulness is defined by Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis,1989). Thus for users of online banking, they will adopt the system if they believe the system will bring benefits such as reducing time spent on going to bank and improving efficiency (Rao et al., 2003).

According to TAM, perceived ease of use is "the degree to which the prospective adopter expects the new technology adopted to be a free effort regarding its transfer and utilization" (Davis, 1989). Therefore if users feel that online banking is easy to use and free of hustle, then the chances of them to use the system will be greater. Jeyaraj et al. (2006) conducted a comprehensive review of predictors of technology adoptions by organizations and individuals that were published between 1992 and 2003 and found that TAM is one of the most widely used technology adoption model. Although TAM was first introduced in 1989, it is still being widely used as shown in Jeyaraj et al. (2006). However, many research state that TAM itself is insufficient to explain users' decisions to adopt technologies, therefore they use TAM as a base model and extended the model by adding additional variables to the model depending on the types of technologies they studied. For example, Kamarulzaman (2007) on his study of internet shopping adoption drew upon TAM and included personal and cognitive influence. Amin (2007) also modified the original TAM by including perceived credibility and the amount of information on mobile credit card were added to his study of mobile credit card usage intentions. Various extensions to the TAM were also conducted in the study of online banking such as those conducted by Pikkarainen et al.(2004) also used TAM as a base and included various factors such as security and privacy, enjoyment and amount of information.

Other researchers have also tried to combine TAM with other technology adoption models. Hernandez and Mazzon (2007) applied TAM with other technology adoption models such as Innovation Diffusion Model and TAM2, which is an extension of TAM in their study on online banking implementation in Brazil. Gounaris and Koritos (2008) applied Perceived Characteristics of the Innovation (PCI) model in their online baking adoption study. However, the model is a combination of TAM with another model known as Innovation Diffusion Model which looks at a technology's characteristics in the study of technology adoption.

Based on existing studies, our research will also use TAM as the base model and will extend the model by including other variables which we believe are important for the studies of online banking adoption in Iran. Our model has been constructed from other variables such as **trust** that is extracted from a research that was conducted in Vietnam by Chong et al (2010), use of other banking products and Internet experience that is extracted from a research that was conducted in Poland by Polasic & Wisniewski (2008).

**Trust**

Trust is an important element affecting consumer behavior and it determines the success of technologies adoption such as e-commerce (Chen and Barnes, 2007; Holsapple and Sasidharan, 2005; Goles et al., 2009; Yang et al., 2009). In our study, trust is defined as the extent to which an individual believes that using online banking is secured and has no privacy threats. Therefore our study focuses on the element of security and privacy from the consumers' perceptions as to whether they believe transactions on internet banking is secured and private (Chong et al, 2010). Such definition is similar to Eriksson et al. (2005) in which they define trust from the customers' perception on security and reliability of the online banking system.

Sathye (1999) found that security and privacy concerns are identified as the "biggest obstacles" to the adoption of online banking in Australia. Trust is also more crucial and complex in internet banking than traditional banking due to its virtual environment. Thus, to complete the purchase transaction, customers have to trust the online business and online transaction of the bank. Without trust the consumer will avoid making any transaction online. This is particularly important in Iranian's culture whereby transactions were conducted face to face and most people have little experience on internet transactions.

Grabner-Krauter and Faullant (2008) investigated if technology trust has a role in influencing the usage of internet banking. One factor which influences the technology trust is whether the system is secured or not and they recommended that it is possible for banks to improve the security of the system to increase the level of consumers trust.

Jahangir and Begum (2008) found that consumers' trust on security and privacy are both important factors in influencing the adoption of online banking in Bangladesh (another developing country), which like Iran, is at an early stage of online banking implementation.

Hernandez and Mazzon (2007) conducted a comprehensive study on internet banking adoption in Brazil and their results are consistent with other studies, which support the importance of security and privacy in influencing the adoption of online banking.

Amin (2007) indicates that trust is the "heart of the system" for online banking.
Thus, we can say that internet banking is susceptible to greater sense of insecurity than older banking services and thereby importance of trust is also relatively higher in adoption of internet banking. Since the impact of trust on intention to adopt is hard to be ignored in this study, we propose the following hypothesis:

**H1. Trust will have a positive effect on the internet banking adoption.**
**Perceived usefulness**
There is also extensive research in the IS community that provides evidence of the significant effect of perceived usefulness on usage intention (Agarwal and Prasad, 1999; Davis et al., 1989; Hu et al., 1999; Jackson et al., 1997; Venkatesh,1999, 2000; Venkatesh and Davis, 1996, 2000; Venkatesh and Morris, 2000). The ultimate reason people exploit Internet banking systems is that they find the systems useful to their banking transactions. Therefore, we test the following hypothesis:

**H2. Perceived usefulness has a positive effect on the internet banking adoption.**
**Perceived ease of use**
Extensive research over the past decade provides evidence of the significant effect of perceived ease of use on usage intention, either directly or indirectly through its effect on perceived usefulness (Agarwal and Prasad, 1999; Davis et al., 1989; Hu et al., 1999; Jackson et al., 1997; Venkatesh, 1999, 2000; Venkatesh and Davis, 1996, 2000; Venkatesh and Morris, 2000). In order to prevent the "under-used" useful system problem, Internet banking systems need to be both easy to learn and easy to use. ITs that are easy to use will be less threatening to the individual (Moon and Kim, 2001). This implies that perceived ease of use is expected to have a positive influence on users' perception of credibility in their interaction with the Internet banking systems.

Thus, we hypothesize that perceived ease of use will have a positive effect on perceived usefulness, perceived credibility, and behavioral intention for using the Internet banking systems.

**H3. Perceived ease of use will have a positive effect on the internet banking adoption.**
**Use of other banking products**
The extant literature indicates that a new banking product is initially embraced by consumers who are financially innovative (Gerrard and Cunningham, 2003). Historical track record of technology use may be a good indicator as to individual's innovativeness. Lee et al. (2005) documented that consumers who heavily utilized the existing electronic services such as ATMs or telephone banking showed a greater propensity to adopt internet banking. This phenomenon is probably not attributed to innovativeness alone, but also to other factors, such as compatibility with self-service technologies. Certain groups of customers may simply enjoy the experience of a personalized face-to-face service, which may sometimes slow the diffusion of cost-cutting financial innovations (Mattila et al., 2003).

It is consequently hypothesized that users of certain existing technologies are more likely to adopt online banking. Specifically, we investigate whether mobile banking customers and holders of debit, credit

and virtual cards are more likely to apply for an internet account. The results reported here can also be insightful for bank managers, as they allow evaluation of whether online banking is a complementary service, or whether it merely crowds out other banking products.so:

**H4: Use of other banking products will have a positive effect on the internet banking adoption.**
**Methodology**
**Sampling and data collection**
　　　A survey instrument was developed for testing the hypotheses in this study. In order to ensure the content validity of the scale used, it is advised to largely adapt the items for each construct from prior researches (Luarn and Lin, 2005). Therefore 20 survey items for Five constructs in the questionnaire were adapted from prior empirical studies and are modified to fit into the context of online banking.
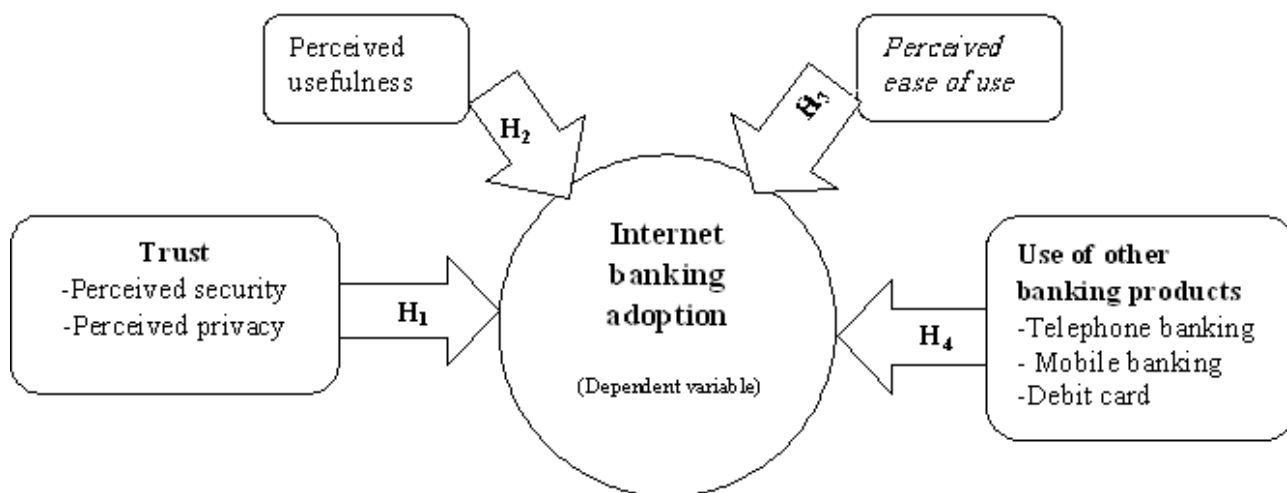


Figure 1.

　　　Table I shows the sources of where the questions were adapted from. In order to ensure that the survey is valid, we also distributed our survey forms to ten executives from the banking industry and university professors for their comments and amended our survey form based on the feedbacks we received from them. The content validity through the Cvr[2] formula was 0.8. To determine the reliability of the questionnaire, Cronbach's alpha coefficient was calculated to 0.810, which shows the reliability at the high level (Table I).
　　　This research was implanted in Iran. The target population for this study are customers of Iranian's banks that are located in Tehran. So surveys for this study were distributed at banks located in Tehran, Iran. We have chosen Tehran as it is the capital of Iran, and most of the major banks are located in Tehran. The method of this research sampling is multiple cluster sampling. Firstly we chose eight major governmental and private banks that have more than 80% branches of banks in Tehran, then randomly, we chose five regions based on Geographical conditions from North, South, East, Central and West areas of the city, and in each region we chose a branch of each bank accidentally. Our sample size is based on Cochran formula, which is 385. So the questionnaire was given to customers who had experienced online banking (we asked each customer if they had online banking experience) at the time they enter the bank.

**Independent variables**
　　　A total of 16 items were developed to capture the four adoption factors. Each question was measured by five-point Likert scale. For instance, "1" denotes as strongly disagree,"2" denotes as disagree, "3" denotes as neutral, "4" denotes as agree and "5" denotes as strongly agree.

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[2] - content validity ratio

**Dependent variable:**
**Internet banking adoption**
The Internet banking adoption was measured using five-point Likert scale where
1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree.

Table1 .Construct, their sources and Cronbach's alpha

| Constructs | Number of items | Sources | α |
|---|---|---|---|
| Trust | 3 | Chong et al(2010) | 0,782 |
| Perceived usefulness | 5 | Chong et al(2010) | 0,766 |
| Perceived ease of use | 5 | Chong et al(2010) | 0,750 |
| Use of other banking products | 3 | Polasik & Wisniewski (2008) | 0,715 |
| Internet banking adoption | 4 | Chong et al(2010) | 0,754 |
| Total | 20 | | 0,810 |

**Data analysis**
**Profile of respondents**
      In the survey, the gender distribution of the respondents is 57.9 percent males and 42.1 percent females. The results also indicate that the respondents are relatively young, with 83.2 percent between 18 and 39 years old. Majority of the respondents have college or higher education level:
      29.3 percent are diploma or advanced diploma holders, 42.9 percent have degree or professional qualifications level and 22.6 percent have master's degree of education.3.6 percent have PHD degree. Merely a total 1.6 percent of the respondents have high school qualification.

**Factor analysis**
      Firstly, normal data distribution was investigated using Kolmogorov- Smirnov, and parametric test, Pierson correlation test to study relation between independent and dependent variable, was used due to normal distribution of study. Then, to study the impact of independent variable on dependent variable in model, we used multiple linear regression. In multiple linear regression, we tried to confirm the model at first, using ANOVA test (regression linearity) and Durian-Watson (self-correlation of disruption words). Then, we calculated linear regression line using nonstandard coefficient, and could predict independent variable value from dependent variable value. Finally, we calculated the impact value of independent variable on dependent variable using standard coefficient.

Table 2.

| Model Summary[b] | | | | | |
|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
| 1 | .820[a] | .672 | .668 | .28140 | 2.128 |
| a. Predictors: (Constant), perceived ease of use, perceived usefulness, trust, Use of other banking products | | | | | |
| b. Dependent Variable: adoption | | | | | |

**Multiple Linear regression analysis**
      Multiple regression analysis was conducted to examine the relationship between adoption factor for online banking and consumer intention to use online banking. It is a constructive statistical technique that can be used to analyze the associations between a set of independent variables and a single dependent variable (Hair et al., 2005).

The Anova test was conducted to examine whether the model is a linear regression or not, as you ca see in Table 2 , for all the constant the significance level is 0.000, which is less than 0.05 error, so, we conclude that all the hypothesis have linear regression
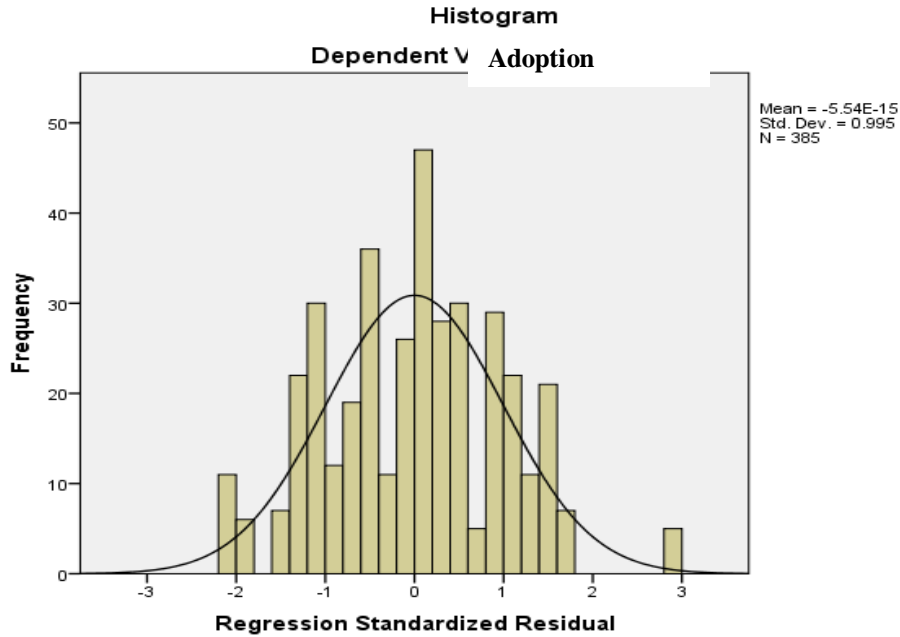


Figure 2.

Table 3.

| ANOVA[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
| 1 | Regression | 61.533 | 4 | 15.383 | 194.272 | .000[b] |
| | Residual | 30.090 | 380 | .079 | | |
| | Total | 91.623 | 384 | | | |
| a. Dependent Variable: adoption | | | | | | |
| b. Predictors: (Constant), perceived ease of use, perceived usefulness, trust, Use of other banking products | | | | | | |

## Correlation analysis

Pearson correlation analysis was conducted to examine the relationship between the variables (Wong and Hiew, 2005; Jahangir and Begum, 2008). As cited in Wong and Hiew (2005) the correlation coefficient value (r) range from 0.10 to 0.29 is considered weak, from 0.30 to 0.49 is considered medium and from 0.50 to 1.0 is considered strong.

However, according to Field (2005), correlation coefficient should not go beyond 0.8 to avoid multicollinearity. Since the correlation coefficient in the table are all less than 0.8, we can assume that there is no multicollinearity problem in this research. Further testing based on VIF and Tolerance (see Table 4) shows that the VIF values for all the variables are less than ten and Tolerance is more than 0.10 thus further supporting that there is no multicollinearity issues in our study (Hair et al., 2005; Chong and Ooi, 2008).

Table 4. Regression analysis of adoption factors for online banking users on consumer intention to use online banking

| Coefficientsa | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | Collinearity Statistics | |
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | .236 | .135 | | 1.744 | .082 | | |
| | Trust | .092 | .046 | .080 | 1.987 | .048 | .528 | 1.894 |
| | Use of other banking products | .324 | .051 | .296 | 6.296 | .000 | .392 | 2.551 |
| | Perceived usefulness | .252 | .050 | .205 | 5.060 | .000 | .528 | 1.894 |
| | Perceived ease of use | .374 | .038 | .384 | 9.825 | .000 | .565 | 1.770 |
| a. Dependent Variable: adoption | | | | | | | | |

As it is shown in the Table 4, since significance level for all constant is less than 0.05 error and the result of T test for all the constant is more than 1.96 with 95% reliance we can conclude that all the constants have positive effect on internet banking adoption.

**Results of hypothesis examination**
**Results of first hypothesis examination**
Trust has positive effect on internet banking acceptance. Since significance level is 0.048, which is less than 0.05 error, we conclude with 95% reliance that trust has positive effect on internet banking, and Standardized Coefficient is also 8.0 percent which its value is positive (linear).

**Results of second hypothesis examination:**
Perceived usefulness is led to internet banking acceptance. Sine significant level is 0.000 and less than 0.05 error, we conclude with 95% reliance that recognized usefulness is led to increase acceptance of internet banking and Standardized Coefficient is 20.5 percent which is positive (linear) value.

**Results of third hypothesis examination:**
Perceived ease of use increases the chance to use internet banking. Since significance level is 0.000 and less than 0.05 error, we conclude with 95% reliance that recognized usage facility increases the chance to use internet banking and Standardized Coefficient is 38.4 percent which is positive (linear).

**Results of fourth hypothesis examination:**
To use other banking services increases probability to open internet account. Since significance level is 0.000 and less than 0.05 error, we conclude with 95% reliance that to use other banking services increases probability to open internet bank account and the Standardized Coefficient is 29.6 percent which is positive (linear).

**Discussion**

This paper research has empirically validated the proposed research model. All the hypotheses regarding the relationship between the variables are developed and tested by using reliability test and linear regression. In general, the results partially supported most all of the developed hypothesized relationships. These findings will be discussed in following subsections (Figure 3).

**The effect of each independent variable on dependent variable in the model (pass analysis)**
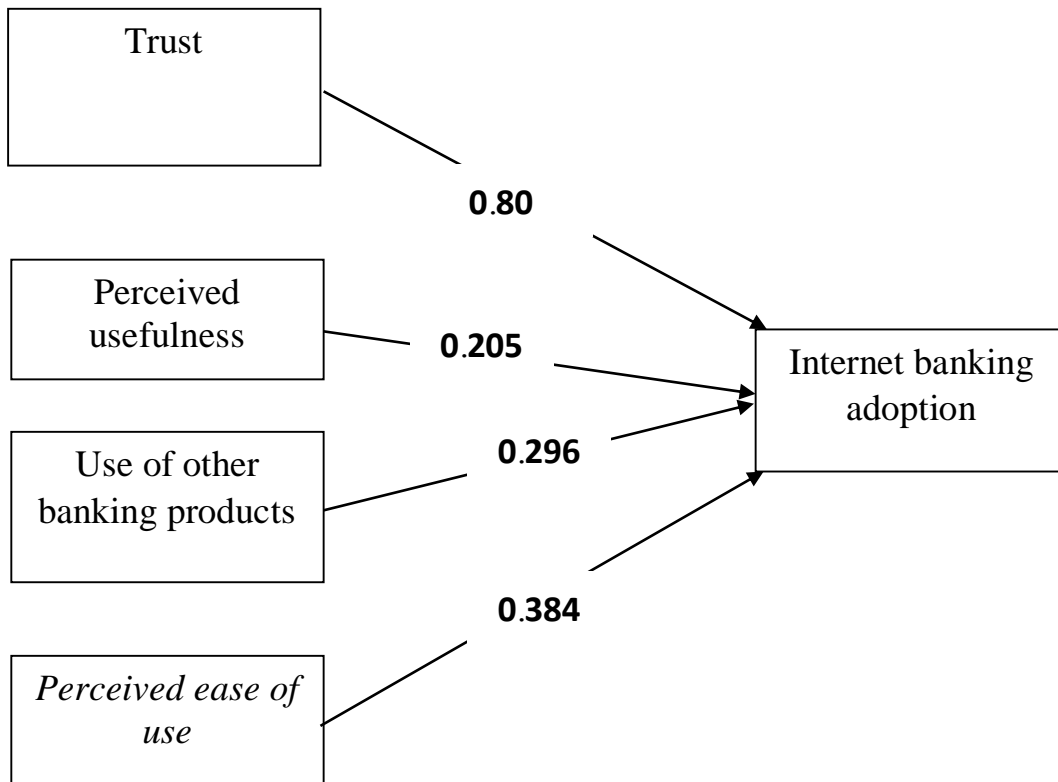


Figure 2.

**Results of research model**
**Managerial implications**

Users will not use provided online banking services without appropriate security and protection of privacy. Banking transactions usually will be monetary transactions, since according to Barnes and Wang (2007). Users, especially users in developing countries used to face to face monetary transactions, so they will be more cautious in using online banking services. Some of the trust making strategies could be advertisement campaigns, insuring personal privacy of costumers (Wei et al, 2009), designing safer and more advanced network systems using up to date global IT technologies.

Lacking official education and experience to use internet, are obstacles for internet banking acceptance. Therefore, specific groups of costumers may imagine internet banking as a complicated and difficult activity.

Banks should provide their customers the necessary trainings to mitigate these problems, and design their systems user friendly as much as possible. Bank's website should be clear and exist data should be written in a non-technical language in it, and encourage customers to use these services and create desirable experience for them.

Users will apply these technologies, when they recognize their usefulness. Therefore, in Iran banks should try to inform their customers about internet banking benefits comparing traditional banking, which elevating customers productivity, their easier connection with bank, and improvement of personal working performance could be mentioned as internet banking benefits.

The main purpose of Perceived usefulness hypothesis is that: when customers are informed about using internet banking comparing traditional banking, they will accept internet banking. Therefore, banks should create services and specifications that recent customers, evaluate them useful, and in the case of benefits of using internet banking, let customers know about them using appropriate advertisement.

Since, using other banking services has positive impact on internet banking adoption, therefore applying special sales strategies such as an account that has all 3 characteristics: internet account access, credit card, and text (sms) banking services, may be perceived as an interesting and appropriate option by majority of customers.

Economy literacy claims that in situation which dealers have the authority of the market; product's package sales could provide them more sales and more gain (Schmalensee, 1984; MacAfee et.al, 1989). Therefore, using service packages which include internet banking with other banking services, may lead banks to more gains, and increase internet banking acceptance.

A     s Perceived ease of use predicts positive attitude toward internet banking, it means that with enhancing Perceived ease of use, a positive attitude toward using internet banking could be achieved, it is advised to banks that detect factors that influence the ease of IT usage.
Such as: Providing full illustrated description of using internet banking stages for users in the website.

Appropriate website designing, paying attention to website design standards, and entirely designing user friendly website, will be critical aspects. Among this, observing global standards of website is essential. Designing website according to global standards help users to use it with a same pattern in all banks, with least mental occupation and little by little they  become accustomed to use it as an ordinary activity. This issue helps them to have shared experience and understanding of appearance and face of website. Accordingly, users do not need to learn navigation and usage manual of different websites.

## Limitation and future study

There are several limitations in this research study. First, the current study is only focused from the perspective of Iranian users. Although the idea of conducting a study in Iran will give insights into online banking adoption issues in a developing country, future study can apply model used in this study to other developing countries.

Second, as with previous adoption studies, the factors selected may not cover all the reasons that could influence the adoption of the internet banking scenario in Iran.

Therefore future studies can consider looking into factors related to cultural issues, which might have an influence in the adoption of online banking services. Third, the demographic profiles of this study are of a group of relatively young age users.

Lastly, our study only looks at the relationships between the adoption factors and intention to adopt online banking. Future study can test whether there are any causal relationships between the independent variables such as perceived ease of use on perceived usefulness or trust on perceived usefulness and perceived ease of use.

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