

ORIGINAL ARTICLES

Factors influencing the intendancy of e-banking: An integration of TAM & TPB with e-service quality

¹Hosein Khanifar, ²PhD, Zeinab Molavi, ³MS, Gholam Reza Jandaghi, ⁴PhD Mohammad Javad Mohaghegh Niya, PhD

¹Associate Professor of Faculty of Management of Tehran University, Qom College, Iran

²Master of science educated of Business- Financial Management, Tehran University, Qom College, Iran

³Professor of Faculty of Management of Tehran University, Qom College, Iran

⁴Assistant Professor of Faculty of Management of Allameh Tabtabai University, Tehran, Iran

ABSTRACT

In recent decades, banks have rapidly moved toward investment on e-banking systems to serve customers. Despite of such investments, reports show that these technologies are not competently welcomed by customers. Therefore, present study aims to identify affecting factors on customers' intention to use e-banking. In present study, electronic service quality integrated with Technology Acceptance Model and Theory of Planned Behavior model to explain customers' intention to use e-banking. Research statistical population consists of customers of Passargad and Meli Banks in Qom Province that have used at least one of the e-banking systems so far. Sampling method for Bank Meli is cluster method. Simple random method is used for Passargad Bank. Data collection instrument is questionnaire. Totally, 353 filled questionnaires were returned. Structural Equation Modeling was used to analyze the data. The results of structural equations modeling confirm model fitness in studied population. Likewise, the results from path analysis show that perceived e-service quality and subjective norm have significantly direct influences on intention to use. However, the findings indicate that perceived behavior control and e-service quality have significantly indirect influence on intention to use. In the meantime, shown other variables of models have non-significant influence on intention to use.

Key words: Technology acceptance model (TAM), Theory of planned behavior (TPB), E- banking, Electronic service quality.

Introduction:

Over the past two decades, the banking industry has invested substantial resources in bringing information technology to consumers. Responding to deregulation, rapid global networking, and rising income levels, the banking industry has implemented new technology-based services called "e-banking" in order to achieve and maintain strategic advantages (Joseph & Stone, 2003, p.190).

Although, in recent decade, in Iran, banks attempted to establish e-banking systems (Fatemi Ardecani, 2005, p.67); reports show that these technologies are not competently welcomed by customers (Moghli, 2007, p.82).

Because of understanding and creating the conditions under which information systems will be embraced by the individual remains a high-priority research issue(Venkatesh & Davis, 2000, p.186); many studies has been conducted over the last decade in explaining and predicting user acceptance of information technology.

Although several research projects have focused on the factors that impact on the adoption of information technology or internet for the past decade(Lee, 2009, p.130), there is limited empirical work which captures the success factors of e-banking in Iran(such as Shahroodi & Sayad Azari,2010; Bagheri *et al.*, 2009; Sayed Javadin & Yazdani, 2005; etc) and in the other countries (such as Weeraseskara,2011; Eze *et al.*,2011; Shih & Fang,2004; Polatoglu & Ekin,2001; etc).

On the other hand, the recent technological revolution has changed the perceived service quality of customers and values to access lots of services. The Information Technology (IT) is being used extensively in almost every field of life including banking sector (Rasheed & Latif, 2011, p. 59). Therefore, nowadays, the mission of banks is delivery of qualified and suitable services to the customers (Hasani *et al.*, 2008, p.11).

Because Internet is still a new transaction channel banks do not exactly understand what service is desired from customers (Yang *et al.*, 2004, p.1150). However, there were some studies focusing on retaining customers on electronic environment, but few of them started from issues of service quality (Dai *et al.*, 2005, p.1375). Unfortunately, few studies have been done on service quality within e-banking (Aronsohn, 2006, p.25) and

Corresponding Author: Hosein Khanifar, Associate Professor of Faculty of Management of Tehran University, Qom College, Iran.

Tel: +989363076109

E-mail: ze_molavi@yahoo.com

likewise, no study has been done on service quality as a factor of adoption of e-banking. Therefore, as a basis of promotion e-service quality, the firms should be founded understanding of how customers perceive and evaluate e-service quality (Zeithaml, 2002, p.135). Thus, various dimensions and scales were developed to assess service quality in electronic fields. In this study Parasuraman *et al.* (2005) basic scales were used to assess e-service quality.

Previous researches review shows that TAM and TPB have been used in many studies to predict factors influence user adoption an online system (Cheng *et al.*, 2006; Lee, 2009; Wu and Chen, 2005); therefore, these models are appropriate tools for understanding intendency of e-banking use. This study integrates e-service quality with the TAM and TPB model to explain customers' intention to use e-banking. This study aims to:

1. To identify which factors are influencing the intention to use e-banking base on variables of TAM & TBP model.
2. To investigate the significantly impact of perceived e-service quality on customers' intention to use e-banking.

This paper proceeds as follows: The literature on e-service quality will be introduced; outlines research model and hypotheses; the methodology, data analysis, and results are detailed; and provides implications. Finally, conclusions for further research and limitations of this research are addressed.

Literature review:

Electronic service quality:

In order to define the concept of e-service quality, at first, need to introduce the concept of service quality: De Ruyter *et al.* (2001, p. 186) describe e-service as "content-centered and internet-based customer service, driven by the customer . . . with the goal of strengthening customer-service provider relationships". The concept of e-service quality can be defined as "the customer overall evaluation and judgment of the excellence and quality of e-service offering in the virtual marketplace" (Santos, 2003, p.235). E-service quality is defined broadly to encompass all phases of a customer's interactions with a corporate which that is base on net work and internet (Parasuraman *et al.*, 2005, p.217).

Various dimensions and scales were developed to assess service quality in electronic fields. Parasuraman *et al.* (2005) developed seven multiple-item scales (E-S-QUAL) for measuring the service quality. The basic E-S-QUAL scale developed in four dimensions and the second scale, E-RecS-QUAL, is salient only to customers who had nonroutine encounters with the e-systems (Parasuraman *et al.*, 2005, p.213).

Table 1: Dimensions for measuring the e-service quality(Adapting from Parasuraman *et al.*, 2005, p.220).

<i>E-S-QUAL</i>
1. Availability: The ease and speed of accessing and using the e-services.
2. Fulfillment: The extent to which the corporate's promises are fulfilled.
3. Efficiency: The correct technical functioning of the e-services.
4. Privacy: The degree to which the site is safe and protects customer information.
<i>E-RecS-QUAL</i>
1. Responsiveness: Effective handling of problems.
2. Compensation: The degree to which the site and systems compensates customers for problem.
3. Contact: The availability of assistance through telephone or online representatives.

Technology Acceptance Model (TAM):

TAM, introduced by Davis (1986), is an adaptation of TRA specifically tailored for modeling user acceptance of information systems. The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified(Davis *et al.*,1989,p.985).

TAM posits that two particular beliefs, perceived usefulness and perceived ease of use, are of primary relevance for computer acceptance behaviors (Figure 1). Perceived usefulness is defined as the prospective user's subjective probability that using a specific application system will increase his or her job performance (Davis, 1986, p.26). Perceived ease of use refers to the degree to which the prospective user expects the target system to be free of effort (Ibid).

Theory of Planned Behavior (TPB):

TRA is used to predict an individual's behavior only in a real voluntary situation, not in a mandatory context (Li, 2008, p.6). Therefore, Ajzen (1991) develops the Theory of Planned Behavior to extend TRA to consider the mandatory situation (figure 2). He adds a new construct of perceived behavioral control in TPB.

Perceived behavioral control is defined as “the perceived ease or difficulty of performing the behavior” (Ajzen, 1991, p.188). In the context of IS research, perceived behavioral control is defined as “perceptions of internal and external constraints on behavior” (Taylor & Todd, 1995, p. 149).

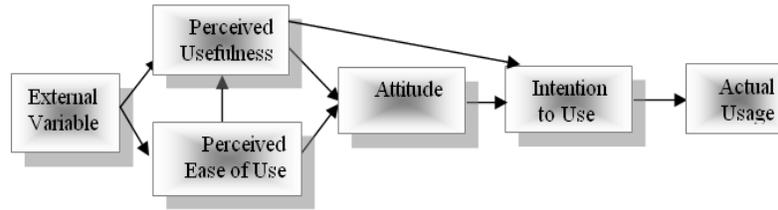


Fig. 1: The Technology Acceptance Model (Davis *et al.*, 1989, p.985).

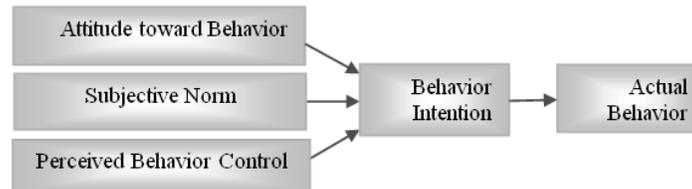


Fig. 2: The Theory of Planned Behavior (Ajzen, 1991, p.181).

The Theory of Planned Behavior is similar to TRA in that TPB also assumes that individuals are rational decision makers. Individuals assess perceived behavior control using a method similar to the expectancy-value model. For each in a set of control beliefs, individuals multiply the belief's strength by the perceived power of the control factor (Li, 2008, p.6).

Research model and hypothesis:

According to Lee (2009), recently, a growing body of research has focused on integrating TAM and TPB to examine e-service acceptance because the two models are complementary, and the results have showed that the integration model had better exploratory power than the individual use of TAM and TPB. Taylor & Todd (1995) and Shih & Fang (2004) show that integration models better explore the factors influencing adoption of e-banking. Therefore, in this study, integration model of TAM and TPB was used.

Bagheri *et al.* (2009) have shown significantly direct influences of perceived ease of use, perceived usefulness and trust on attitude. In the meantime, their research has shown attitude has a direct effect on intention to use internet banking. The results of Shahrodi & Sayad Azari (2010) shown perceived behavior control has positive influence on subjective norm and intention to use internet banking. Subjective norm has positive influence on attitude towards use internet banking. However, subjective norm hasn't significantly direct influence on intention to use internet banking. According to Lee (2009), attitude towards use, perceived usefulness, subjective norm and perceived behavior control have significantly direct influences on intention to use internet banking. The findings of Shih & Fang (2004) indicated that an important factor influence the intention to use is attitude towards use. However, subjective norm hasn't significantly direct influence on intention to use internet banking.

Studies show that when the customer is in direct contact with the technology there is greater control such as with Internet banking. However, if there is an absence of direct contact, such as with telephone banking it is assumed that there is less control perceived by the customer during this transaction (Joseph *et al.*, 1999, p.183). In the other hand, studies show that availability, efficiency fulfillment and Privacy -dimensions of e-service quality) have positively influences the intention to use e- banking (Parasuraman, 2000; Liao & Cheung, 2002; Akinci *et al.*, 2004; Nezam Zade, 2009).

Based on theoretical background, following research model and hypotheses are proposed.

According to the model, seven variables use to conduct this study: Electronic service quality (ESQ) with four sub dimension, Perceived ease of use (PEU), Perceived usefulness (PU), Attitude, Subjective norm (SN), Perceived behavior control (PBC) and intention to use. Then, hypotheses of this research are following:

- H1. E-service quality positively influences the intention to use e- banking.
- H2. E-service quality positively influences the perceived behavior control.
- H3. Perceived ease of use positively influences the perceived usefulness.
- H4. Perceived usefulness positively influences the attitude towards the use of e-banking.

- H5. Perceived ease of use positively influences the attitude towards the use of e-banking.
- H6. Perceived behavior control positively influences the subjective norm.
- H7. Perceived behavior control positively influences the attitude towards the use of e-banking.
- H8. Subjective norm positively influences the attitude towards the use of e-banking.
- H9. Attitude positively influences the intention to use e- banking.
- H10. Subjective norm positively influences the intention to use e- banking.
- H11. Perceived behavior control positively influences the intention to use e- banking.

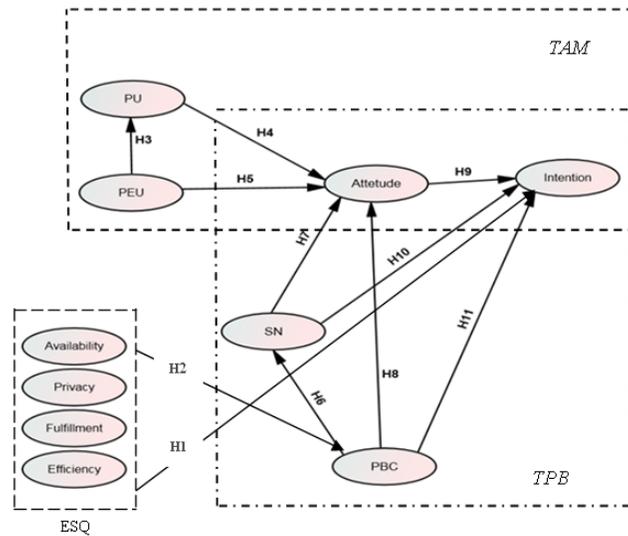


Fig. 3: The proposed research model.

Research method:

Research statistical population and sample:

Based on consulted opinions, Meli and Passargad Banks in Qom Province - Iran were chosen as the target population for this study. Meli Bank is the largest and the most important governmental national bank in Iran. This bank has been established in 1927. Passargad Bank is one of the most important privacy banks in Iran and has been established in 2005. At present, Meli and Passargad Banks have, respectively, 49 and 2 branches in Qom Province. Since, this study aimed to investigate effect of customers' perceived e-service quality on intention use e-banking; therefore, participants were required to have used e-banking services such as ATM, Internet banking, Phone banking and Mobil banking prior. Thus, research statistical population consists of customers of Passargad and Meli Banks in Qom Province that have used at least one of these e-banking systems so far. The sampling methods of Meli Bank and Passargad Bank are, respectively, cluster and simple random method. The customers were selected using simple random sampling. The number of sample respondents ($n=400$) is considered suitable to apply SEM of analyses for the current study. Totally, 353 filled questionnaires (180 and 173 questionnaires, respectively, from customers of Meli and Passargad Banks) were returned.

Data collection:

The study was conducted on 6 days over a 5-week period. The data was collected from 8 branches from the Meli Bank and 2 from the Passargad Bank, counting up to 10 branches in total. From each branch, at least, 30 customers participated in this study. Totally, for collect e-banking customers' information, distributed 400 questionnaires, with incomplete questionnaires deleted, result in 353 customers as sample size of this study (rate of 88%). The demographic profile of the participants is provided in Table 2.

As shown in Table 2, the majority of respondents (56.7%) did not have using e-banking as major method of performance banking transactions. 37.4% of the respondents were under 20 years old. 70% of the respondents were male and 30% were female. Finally, the education levels of respondents were 65% college, about 10% master & PhD and 25% high school.

Table 2: Sample demographics.

Measure	Item	Frequency	Percentage (%)
Age	Under 25	132	37.4
	25-35	99	28
	35-45	69	19.5
	>=45	53	15
Gender	Male	274	70
	Female	106	30
Education level	High school	88	24.9
	College/university	230	65
	Master & PhD	35	9.9
Major method of performance his/her banking transactions	Attendance	200	56.7
	ATM	101	28.6
	Internet banking	35	9.9
	Phone banking	11	3.1
	Mobile banking	6	1.7

Measurement:

A three-part questionnaire was designed to conduct this study: (1) basic information about respondents' characteristics including gender, age, education and major method of performance banking transactions; (2) customers' perceived e-service quality (4 dimensions and 14 items adapted from basic scales defined by Parasuraman *et al.* (2005); and (3) questions to assess the constructs of perceived usefulness, perceived ease of use, attitude, subjective norm, perceived behavior control and intention to use were adapted from the measurements defined by Cheng *et al.* (2006), Wu & Chen (2005), Zhu *et al.* (2002) and Lee (2009) containing 21 items. Finally, with considered Panel of Judges modified the questionnaire to e-banking field.

The first part includes nominal scales, and the remainder were measured using the five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5).

Before conducting the main survey, pilot test was performed to reliability the instrument. The pilot test involved 35 respondents. Cronbach's alpha scores shown in Table 3 indicated that each construct exhibited strong internal reliability. The expert opinions were sought for in order to content validity of the questionnaire involved 20 experts. Factor analysis was used to factor validity of the questionnaire (see Table 3). Therefore, the instrument has confirmed reliability and validity.

Result:

This paper followed the two-step procedure suggested by Anderson & Gerbing (1988): (1) the measurement model was examined; (2) the structural model was analyzed. Therefore, in order to analyzing the collected data, SPSS16 and AMOS20 soft wares were used.

Since e-service quality has four sub dimensions: 1.Availability (3 items); 2.Privacy (3 items); 3.Efficiency (4 items) 4.Fulfillment (4 items), second-order CFA was carried out (**Error! Reference source not found.**).

The model shows that all of the factor loadings are more than .5 and fit indices are acceptable except P-value and GFI (see Figure 4).

Having had the second-order CFA homogenous parcelled to four items, the measurement model changes to **Error! Reference source not found.**.The purpose was to reduce the number of variables and simplify the subsequent structural equation analysis of the proposed model.

Analysis of the measurement model:

Before evaluating the fit of the structure model, it was necessary to define a measurement model to verify that the 35 measurement variables written to reflect the seven unobserved constructs (Perceived usefulness, Perceived ease of use, Subjective norm and Perceived control behavior, Attitude, Intention and e-service quality) do so in a reliable manner. The overall fit of a measurement model was determined by a CFA.

The results of reliability (Table 3) showed all 7 constructs of Cronbach's alpha have satisfactory values, ranging from 0.816 to 0.832, indicating acceptable levels of internal consistency. Similarly, the coefficients of composite reliability have satisfactory values. The lowest score of composite reliability in the current study was 0.702. According to Fornell and Larcker (1981) and Hair *et al.* (2006), these scores indicated evidence of reliability. All indicator factors loading should be significant and exceed 0.5 (Fornell & Larcker, 1981 & Hair *et al.*, 2006). The factor loading values of the measurement model exceeded 0.5. Therefore, convergent validity was met.

CChi-square (df) = 348.362 (73); P value (≥ 0.05) = .000;
 Relative Chi-Sq (≤ 5) = 4.772;
 GFI (≥ 0.9) = .870; CFI (≥ 0.9) = .912; IFI (≥ 0.9) = .912;
 RMR (≤ 0.05) = .040.
 (Standardized estimates)

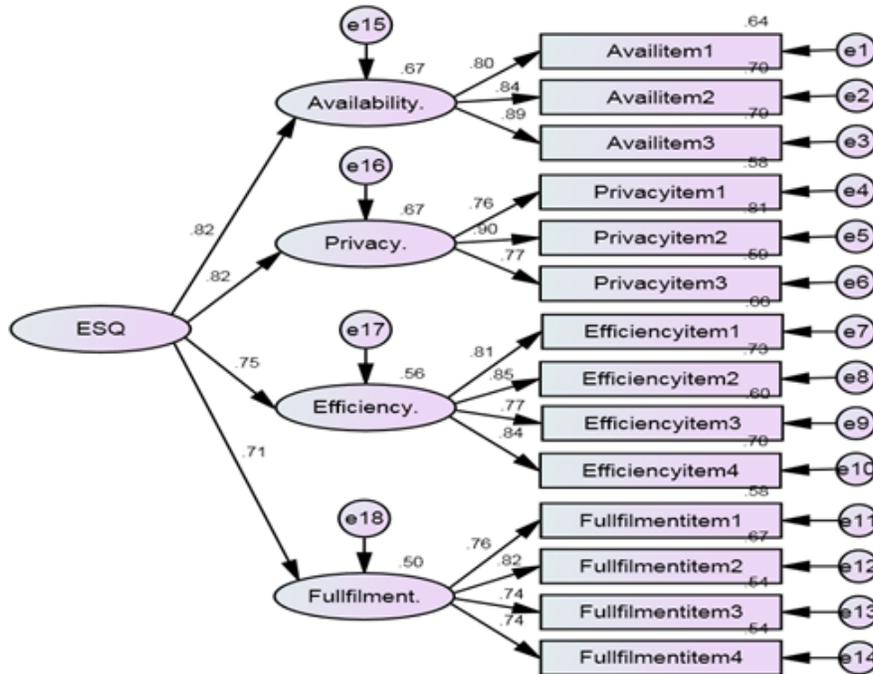


Fig. 4: Second-order CFA for e-service quality dimensions.

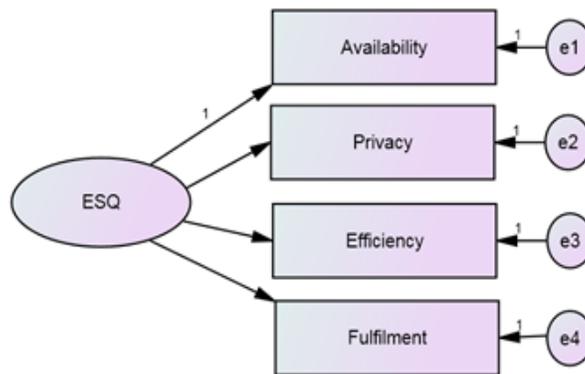


Fig. 5: Homogenous parceling method for service quality factors.

Discriminant validity assesses the extent to which a concept and its indicators differ from another concept and its indicators (Bagozzi *et al.*, 1991). According to Byren (2010), the correlations between items in any two constructs should be lower than 0.9. Correlations between the construct and any other construct in the proposed model in this study were lower than 0.9, satisfying Byren (2010) criteria for discriminant validity. Thus, construct validity was met (see Table 4).

Analysis of the structural model:

Final model shown in figure 6 (Which dotted line represents no significance)

For assess the goodness-of-fit the chi-square test and other fit indices (e.g., GFI, AGFI, CFI, NFI, and RFI) were considered. The CFA results presented an acceptable level of fit .Chi-square to the degree of freedom of

SEM (χ^2 /df) of 1.139 ($p < 0.05$), goodness-of-fit index (GFI) of 0.937, Tucker-Lewis index (TLI) of 0.967, adjusted goodness-of-fit index (AGFI) of 0.923, comparative fit index (CFI) of 0.971, normed fit index (NFI) of 0.807, and root mean square error of approximation (RMSEA) of 0.02 (see Figure 6). Generally, according to Bagozzi *et al.* (1991); Hair *et al.* (2006); Ho (2006) and Byren(2010), the CFA results presented an acceptable level of fit. Furthermore, RMSEA values up to 0.08 are acceptable (Hair *et al.*, 2006); therefore, the RMSEA value was acceptable.

Table 3: Construct reliability and convergent validity.

Construct/indicator	Item	Factor loading	Composite reliability	Cronbach's alpha
E-service quality	Availability	0.800	0.873	0.817
	Privacy	0.761		
	Efficiency	0.811		
	Fulfillment	0.763		
Perceived ease of use	PEU1	0.514	0.736	0.828
	PEU2	0.6		
	PEU3	0.525		
Perceived usefulness	PU1	0.557	0.712	0.832
	PU2	0.594		
	PU3	0.537		
Attitude	AT1	0.539	0.703	0.829
	AT2	0.561		
	AT3	0.526		
	AT4	0.516		
Subjective norm	SN1	0.590	0.736	0.827
	SN2	0.552		
	SN3	0.511		
Perceived behavior control	PBC1	0.506	0.742	0.824
	PBC2	0.535		
	PBC3	0.551		
	PBC4	0.554		
	PBC5	0.513		
Intention	IT1	0.513	0.702	0.828
	IT2	0.676		
	IT3	0.550		

Table 4: Correlations matrix of variables(Discriminant validity).

Construct	1	2	3	4	5	6	7
1. E-service quality	1						
2. Perceived ease of use	0.080	1					
3. Perceived usefulness	0.00	0.223	1				
4. Subjective norm	-0.031	0.211	0.059	1			
5. Perceived behavior control	0.081	0.038	0.151	0.365	1		
6. Attitude	0.178	0.170	0.159	0.067	0.247	1	
7. Intention	0.269	0.345	0.110	0.123	0.203	0.268	1

Path analysis and hypotheses testing:

Fig. 6 presents the results of the structural. Intention to use electronic banking in this study was jointly predicted by ESQ ($\beta = .223$, Standardized path coefficient, $p < 0.01$), and subjective norm ($\beta = 0.277$, $p < 0.05$) and these variables together explained 60% of the variance of intention to use ($R^2 = 0.60$, coefficient of determination). As a result, Hypotheses 1 and 10 were supported. Attitude was predicted by PEU ($\beta = 0.203$, $p < 0.05$) and SN ($\beta = .372$, $p < 0.01$). Together these variables explained 70% of the total variance of Attitude. These findings validated Hypotheses 4 and 8. PEU ($\beta .218$, $p < 0.05$) significantly influenced perceived usefulness while explaining 47% of the total variance in perceived usefulness. Accordingly, Hypothesis 3 was supported. PBC ($\beta = .253$, $p < 0.01$) significantly influenced subjective norm while explaining 64% of the total variance in subjective norm. Consequently, Hypothesis 6 was supported. ESQ ($\beta = .181$, $p < 0.05$) significantly influenced perceived behavior control while explaining 33% of the total variance in perceived behavior control. Accordingly, Hypothesis 2 was supported. Hypotheses results are shown in Figure 6.

The level of ESQ had significant indirect effect ($\beta = .042$, $p < 0.05$) on intention to use e-banking, suggesting the important mediating effects of PBC. The level of PBC had significant indirect effect ($\beta = .071$, $p < 0.05$) on intention to use e-banking, suggesting the important mediating effects of subjective norm. To further assess the significance of indirect effects of predictor variables on intentions to use e-banking, a decomposition of the effects analysis was conducted (see Table 5).

Chi-square (df) = 300.802 (264); P value ($>=0.05$) = .059; Relative Chi-Sq ($<=5$) = 1.139; GFI ($>=0.9$) = .937; CFI ($>=0.9$) = .971; IFI ($>=0.9$) = .972; TLI ($>=0.9$) = .967; NFI ($>=0.9$) = .807; RMSEA ($<=0.08$) = .020.

Sig →
Non Sig - - →

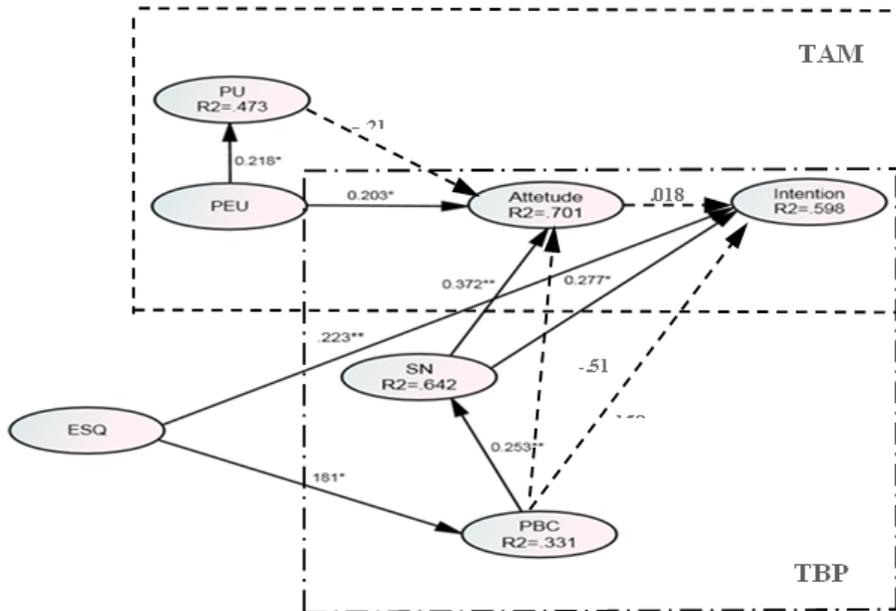


Fig. 6: Final model.

* P<0.05

** P<0.01

Note: dotted line represents no significance

Table 5: Direct, indirect and total effects– estimates.

Variable/ predictors	Intention to use		
	Direct effects	Indirect effects	Total effects
E-service quality	.223**	.042*	.265**
Perceived usefulness		-.021	-.021
Perceived ease of use		.003	.003
Attitude	.018		.018
Subjective norm	.277*	.007	.283**
Perceived behavior control	.159	.071*	.220*

* Significant at p < 0.05
** Significant at p < 0.01

Discussion:

The results of SEM confirm fitness of the research model presented in Figure 1. Therefore, the integrated model of TAM with TPB model with e- services quality is capable of explaining factors influence the intention to use e-banking. Several results could be drawn from this research that presented below:

Subjective norm and electronic services quality emerged as direct factors in the intention to use electronic banking and these variables together explained 60% of the variance of intention to use and 40% of the variance of intention to use is explained by other factors which in this study haven't been considered. The effect of subjective norm on intention to use electronic banking ($\beta=.277$) is more than that of electronic services quality ($\beta=.223$). Therefore, subjective norm appears to be the more important direct predictors to intention to use electronic banking. This result is similar to the finding reported in Lee (2009), which indicated that subjective norm has direct influences on behavioral intentions toward e-banking use. Likewise, the authors such as Parasuraman (2000), Liao & Cheung (2002), Akinci *et al.* (2004) and Nezam Zade (2009) show that dimensions of e-service quality have positively influences the intention to use e- banking. Despite of this result, Shih & Fang (2004) indicated that subjective norm has non-significant influences on behavioral intentions toward e-banking use.

Second, perceived behavior control and e-services quality emerged as indirect factors in the intention to use electronic banking. The indirect effect of perceived behavior control on intention to use electronic banking ($\beta=.071$) is more than that of e-services quality ($\beta=.042$). This implies that the perceived behavior control appears to be the more important indirect predictors to intention to use e-banking. Both studies reached the same conclusion that perceived.

Third, e-services quality has direct and indirect effect on intention to use electronic banking and its direct ($\beta=.223$) is more than its indirect effect ($\beta=.042$).

The fourth finding reveals that other constructs of hypothesized model (PU, PEU and Attitude) didn't have significantly direct or indirect influence on intention to use. Despite of this result, Lee (2009) indicated that PU, PEU and attitude have significant influences on behavioral intentions toward e-banking use. Eze *et al.*(2011), despite of results of this study, shown that PU and PEU have significant influences on intentions toward e-banking use and Shih & Fang(2004) indicated that attitude has significant influence on intentions toward e-banking use.

Academician and managerial implications:

The results of present study reveal some issues related to customer intentions to e-banking that have not been addressed by studies yet. Specially, these findings are notable for banks managers as they decide how to allocate resources to encourage their customers to use the e-banking services by promote e-services quality. Since building a qualified e-transaction environment is much more important to customers, banks need to promote quality of e-banking systems.

This study suggests that they should consider focusing on the power and speed of e-banking systems. As result shown, mobile bank isn't welcomed by customers, it probability, because of, mobile banking is the new e-banking system. Thus, banks could increase familiarity and explain its advantages through advertising. Likewise, this study suggests that they should standardize soft ware and hard ware of e-banking systems. In order to increase customers' knowledge and ability to use e-banking, banks should held training courses about how to use e-banking systems.

On the other hand, present study attempts to develop a new model by integration of two models with service quality. It is important to note that the new variable – perceived electronic services quality – is compatible with the TAM and TPB variables, and the overall proposed model confirms. Hence, the results of this study contribute a significant implication for developing theories to e-banking area and the proposed model makes an important contribution to literature on e-banking. The present study has many implications for future e-banking research.

First, in the present study casual relationship between e-service quality and intention to use was investigated, however, it is notable to study the casual relationship between dimensions of service quality on intention of use.

Second, although TAM has been found an appropriate and robust model by some prior research, it only includes three variables to predict intention to use. However, behavioral intention will also be affected by various factors. Thus, according to Lee (2009) integrated model of TAM and TPB are complementary approaches. Moreover, this study followed Lee (2009) suggested a basis for the integration of other technology acceptance models.

Third, as mentioned earlier, although factors influence the adopting online banking -as one of the e-banking systems- have been studied by many researchers, limited studies conducted regarding all of the e-banking systems. This study conducted regarding all of the e-banking systems. Therefore, this is basis for employing integrated models in the whole e-banking systems.

Finally, although consumer perceptions of various constructs of adopting online banking have been studied by many researchers (Tan & Teo, 2000; Yousafzai *et al.*, 2003; Lee, 2009), yet, e-service quality has not been studied by any researchers. At first time, this paper studied e-service quality as a factor that influences the adopting e-banking.

Conclusions, limitation and future research:

In addition to the implications for management, this research also makes strides in addressing theoretical and practical issues in e-banking research.

The purpose of this paper is to develop an extended TAM with TPB model to predict and explain customers' behavioral intentions to e-banking. The proposed model incorporates e-service quality. The results of structural equations modeling confirm model good fitness in predicting customer's intentions to use such services. The data from this study indicated positive effect of e-service quality on intention to use e-banking systems.

This study, as with any research, has some limitation. Thus, it should be considered that generalization of the findings is limited to similar conditions. First, the geographical area in this study was constraint. The online survey method was appropriate for collecting data from participants with Internet experience and who were free of geographical constraints. Second, the results drawn from current study are based on cross-sectional data. Future researchers could employ a longitudinal study to evaluate this aspect.

Third, the respondents in this study were limited to customers of Iranian banks. The branches of banks were from branches of two Banks in Qom Province. However, similar study could be conducted with considered all banks (and branches).

References

- Ajzen, I., 1991. The Theory of Planned Behavior, *Organizational Behavior and Human Decision Processes*, 50(2): 179-211.
- Ajzen, I., 2002. Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior, 1: 665-83.
- Akinci, Serkan, Aksoy, Safak, Atilgan, Eda, 2004. Adoption of Internet Banking among sophisticated consumer segments in an advanced developing country, *International Journal of Bank Marketing*, 22(3): 212-232.
- Anderson, J.C., D.W. Gerbing, 1988. Structural equation modeling in practice: a review and recommended two step approach. *Psychol Bull*, 49: 411-23.
- Aronsohn, Marcus, 2006. *E-banking and service quality online*, Master Thesis, Department of Service Management, Lound Univercity, Helsingborg.
- Bagheri, M.A., M.T. Hamidi, Beheshti, S. Alidosti, 2009. Adoption of internet banking in Iran: expansion of Technology Acceptance Model, *Iranian Research Institution for scientific Information and Documentation*, 24(3): 5-34.
- Bagozzi, R.P., Y. Yi, L.W. Phillips, 1991. Assessing construct validity in organizational research, *Admin Sci Quarts*, 36(3): 421-30.
- Byrne, Barbara M., 2010. *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*, 2th edition, New York: Taylor & Francis Group.
- Cheng, T.C.E., D.Y.C. Lam, A.C.L. Yeung, 2006. Adoption of internet banking: an empirical study in Hong Kong, *Decision Support System*, 42(3): 1558-1572.
- Dai, Lei, Huang, Lihua, Yi, Yuandong, 2005. How B2C Service Quality Influences Website Continuance, pp. 1375- 1381, available at: <http://www.pacis-net.org/file/2005/206.pdf> (accessed 15 December 2011).
- Davis, F.D., 1986. *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results*, Doctoral dissertation, Sloan School of Management, Massachusetts Institute of Technology.
- Davis, F.D., 1989. Perceived Usefulness, Perceived Ease of Use & User Acceptance of Information Technology, *MIS Quarterly*, 13(3): 319-339.
- Davis, F.D., R.P. Bagozzi, P.R. Warshaw, 1989. User acceptance of computer technology: A comparison of tow theoretical models, *Management Science*, 35(8): 982-1003.
- Eze, Uchenna Cyril, Manyeki, Jeniffer Keru, Yaw, Ling Heng & Har, Lee Chai, 2011. Factors Affecting Internet Banking Adoption among Young Adults: Evidence from Malaysia, *International Conference on Social Science and Humanity*, 5(1): 377-381.
- Fatemi Ardekani, S.V.A., 2005. *Electronic banking and its effect on bank's executive processes: the case of internet bank*, *Articles of third National E-commerce Conference*, Tehran: Deputy for Planning and Economics Affairs of Business Ministry.
- Fishbein, M., I. Ajzen, 1975. *Belief, Attitude, Intention and Behavior: An Introduction to Theorv and Research*, Addison-Wesley, Reading, MA.
- Fornell, C., D.F. Larcker, 1981. Evaluating structural equation models with Unobservable variables and measurement error, *J Marketing Res.*, 18(1): 39-47.
- Hair, J.R., F. Joseph, Black, C. William, Anderson, E. Rolph, 2006. *Multivariate Data Analysis*, 7th edition, available at: <http://www.mediafire.com/?mkrznmjmonn> (accessed 1 December 2011).
- Hasani, M.A., M.T. Hamidi Beheshti, Alidosti, Siroos, 2008. *Electronic banking management*, Tehran: Sabzan.
- Ho, Robert (2006). *Handbook of univariate and multivariate data analysis and interpretation with SPSS*, London/Newyork: Taylor & Francis Group, LLC.
- Joseph, M., G. Stone, 2003. An empirical evaluation of US bank customer perceptions of the impact of technology on service delivery in the banking sector, *International Journal of Retail & Distribution Management*, 31(4): 190-202.
- Joseph, Mathew, McClure, Cindy, Joseph, Beatriz, 1999. Service quality in the banking sector: the impact of technology on service delivery, *International Journal of Bank Marketing*, 17(4): 182-191.

- Lee, Ming-Chi, 2009. Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit, *Electronic Commerce Research and Applications*, 8: 130-141.
- Li, Long, 2008. *A Critical Review of Technology Acceptance Literature*, Referred Research Paper, Department of Accounting, Economics and Information Systems, College of Business, Grambling State University.
- Liao, Ziqi, Cheung, Michael Tow, 2002. Internet-based e-banking and consumer attitudes: an empirical study, *Information & Management*, 39: 283-295.
- Moghli, A.R., 2007. Adoption of internet banking among customers in customers of banks in Shiraz, , *Journal of Management Sciences*, 2(7): 81-98.
- Nezam Zade, Farzin, 2009. *The study of factors influencing the electronic environment of banking service delivery and its influence on customer behavior (Case study: branches of Sepah Bankin Tehran)*, Master Desertion of Administration Management, Faculty of Management, Qom Campus, University of Tehran.
- Parasuraman, A., 2000. Technology Readiness Index (TRI): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies, *Journal of Service Research*, 2(4): 307-320.
- Parasuraman, A., Zeithaml, A. Valarie, Malhotra, Arvind, 2005. E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality, *Journal of Service Research*, 7(3): 213-233.
- Polatoglu, V., S. Ekin, 2001. An Empirical Investigation of the Turkish Consumers Acceptance of Internet Banking Services, *International Journal of Bank Marketing Information*, 19(4): 156-65.
- Rasheed, Mehvish, Latif, Abdul, 2011. Technology-Enabled Service Quality affect Organizational Competencies?, *Journal of Public Administration and Governance*, 1(2): 58-76.
- Ruyter, K., M. Wetzels, M. Kleijnen, 2001. Customer adoption of e-service: an experimental study, *International Journal of Service Industry Management*, 12(2): 184-207.
- Santos, J., 2003. E-service quality: a model of virtual service quality dimensions, *Managing Service Quality*, 13(3): 233-246.
- Sayed Javadin, S.R., Yazdani, Shamsi, 2005. The study of factors influencing the customers intendency of internet banking services (Case study: Saman Bank), *Journal of Management Knowledge*, 7: 45-61.
- Shahroodi, Kambiz, Sayad Azari, Samere, 2010. The study of factors influencing the adoption of internet banking in Gilan Province with using of TAM & TPB, Iranian Marketing Articles, available at: <http://marketingarticles.ir/?p=738> (accessed 12 Out 2011).
- Shih, Ya-Yueh, K. Fang, 2004. The use of a decomposed theory of planned behavior to study Internet banking in Taiwan, *Internet Research*, 14(3): 213-223.
- Tan, M., T.S.H. Teo, 2000. Factors influencing the adoption of internet banking. *JAssoc Inform Syst.*, 1: 1-42.
- Taylor, S., P.A. Todd, 1995. Understanding Information Technology Usage: A Test of Competing Models, *Information Systems Research*, 6(4): 144-176.
- Venkatesh, V., F.D. Davis, 2000. A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, *Management Science*, 46(2): 186-204.
- Weerasekara, Sobitha, 2011. An Empirical Study on Slow and Limited Adoption of Internet Banking By Sri Lankan Customers, *International Conference on Industrial and Information Systems(ICIIS)*, 6: 404- 409.
- Wu, I.L., J.L. Chen, 2005. An extension of Trust and TAM model with TPB in the initial adoption of on-line tax: an empirical study, *Int J Hum Comput Stud.*, 62(6): 784-808.
- Yang, Zhilin, Jun, Minjoon, Peterson, T. Robin, 2004. Measuring customer perceived online service quality: Scale development and managerial implications, *International Journal of Operations & Production Management*, 24(11/12): 11-49.
- Yousafzai, S.Y., J.G. Pallister, G.R. Foxall, 2003. A proposed model of e-trust for electronic banking. *Technovation*, 23(11): 847-60.
- Zeithaml, V.A., 2002. Service excellence in electronic channels, *Managing Service Quality*, 12(3): 135-138.
- Zhu, F.X., W.J. Wymer, I. Chen, 2002. IT-based services & service quality in consumer banking, *International Journal of Service Industry Management*, 13(1): 69-90.