

Full Length Research Paper

Behavioral approach to policy making of the internet banking industry: The evaluation of factors influenced on the customers' adoption of internet banking services

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This study combines the Theory of Perceived Risk (TPR) with the Theory of planned Behavior (TPB) to understand customers' adoption of internet banking in Iran. The questionnaires are designed to survey the randomly selected sample of Iranian national bank customers. The selected sample contains 349 customers who responded to the questionnaire. This research used the structural equation modeling (SEM) to test the causalities in the proposed model and the strength of the hypothesized relationships. The results provide support of the integrated TPR with TPB models and confirm its robustness in predicting customers' intention for adoption of internet banking; also it shown that the security risk has the most destructive effect on the intention of using internet banking, as well as financial risk, and it is made strongly by attitude.

Key words: Internet banking (IB), theory of planned behavior (TPB), theory of perceived risk (TPR), structural equation modeling (SEM).

INTRODUCTION

Debates on the effectiveness of ICT implementation, have often focused on issues of local adaptation and sustainability (Hewitt, 2001). Among the various ICT applications introduced in the last decade, the delivery channels used by the financial services industry are changed by the internet banking. Since the internet banking was introduced, and due to its growing convenience for most users, the internet market has grown into a profitable competitive venue for the banking industry. This study aims to investigate the factors which have affected on the adoption of internet banking services. The internet banking is the focus of this study because it is seen widely as the most important and most popular delivery channel for banking services in the cyber age. There is the clear need to study the factors that influences customers' intention to adopt internet banking.

LITERATURE REVIEW

Theory of planned behavior

The theory of planned behavior (TPB) suggests that the major factor in human behavior is intention which is affected by attitude toward behavior, subjective norm and perceived behavioral control (Ajzen, 1985, 1991, 2002). Subjective norm (SN) expresses the perceived social pressure on the person who intends to perform the behavior. In other words, the subjective norm is related to normative beliefs about the expectations of the other people. Perceived behavioral control (PBC) reflects the person's perception about the difficulties in behavior implementation is questionable. It concerns beliefs about the presence of controllable factors that may facilitate or hinder the behavior. Abundant empirical evidence suggests that the TPB can explain effectively the individual intentions and behavior in adopting new information technologies. Such evidence is the acceptance of

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Table 1. Dimensions of perceived risk.

Dimension	Definition
Security risk	Potential loss of control over personal information when it is used without your permission.
Performance risk	The possibility of the imperfect production as it was designed and advertised; therefore, failing in deliver the desired benefits is expected.
Financial risk	The probability of money loss for purchased goods; however, it won't deliver to customers.
Social risk	The adopting product or services cause to potential loss of status in one's social level or looking insane.
Time risk	Consumers may lose time in some cases, for example wrong decision-making in purchasing, searching for suitable goods, learning how to use a product or service

telemedicine technology by physicians (Chau and Hu, 2002). The widespread adoption of virtual banking is evaluated by Liao, Shao, Wang and Chen (1999). The Computer resource center adoption and usage searched by Taylor and Todd (1995). IT adoption in work settings is also evaluated by Venkatesh, Morrisand and Ackerman (2000).

Theory of perceived risk (TPR)

Since the 1960s, theory of perceived risk has been used to explain the consumers' behavior. Considerable research has examined the impact of risk on traditional consumer decision-making (Lin, 2008). Featherman and Pavlou (2003) defined perceived risk as the possible troubles when pursuing a desired result. Most scholars claimed that consumers' perceived risk is a kind of a multi-dimensional construct. Six components or types of perceived risk have been identified: financial, performance, social, physical, privacy, and time-loss (Jacoby and Kaplan, 1972; Kaplan and Szybille, 1974; Roselius, 1971).

According to either product or service class the dimensions of perceived risk may vary (Featherman and Pavlou, 2003). Internet banking does not incur any threat of human life; therefore, measures of physical risk were not included in this study. The dimensions of perceived risk have defined in Table 1.

Research model and hypothesis

Based on the literature review, in this study the theory of planned behavior (TPB) is combined with the theory of perceived risk (TPR) in order to investigate users' behavior in adopting internet banking services. Figure 1 illustrates the research model for internet banking services adoption which constructed based on TPB and TPR. Ten hypotheses and their supporting studies are summarized also in Table 2.

METHODOLOGY

Data collection

The data were collected by the paper-based questionnaire. Five hundred research questionnaires have been distributed among customers of Iran national bank in Isfahan province; but, 349 of them were responded correctly which were collected also by the systematic sampling method. Structural equation modeling (SEM) is used for the analysis. To modify the construction of the research model and measurement instruments, several professors and users were also interviewed. Sample demographic are shown in Table 3.

Instrument development and pre-test

Regarding instrument construction, the items used to operationalize the constructs of each investigated variables, were mostly adopted from relevant previous studies, with necessary validation and wording changes (Table 4). All items were measured using a five-point Likert-type scale with anchors ranging from strongly disagree to strongly agree. Moreover, the final questionnaire was validated by two professional translators to ensure that no syntax or semantic biases occurred during the translation from English to Persian. Furthermore, to ensure validity and reliability, this study first pre-tested the questionnaire by having three professors and users review it. Once the final survey was administered analysis of the responses of thirty random respondents. Regarding reliability, the survey had strong internal consistency with all multiple-item constructs achieving Cronbach's alpha of 0.81 or higher (Appendix A).

RESULTS

Descriptive statistics

Participants in the study comprised 79.1% male and 20.9% female. Majority of the respondents were between 27 and 35 years old, which was 41.8% of the total respondents and 37.2% of them were in the age range of 36 - 44 years. Majority of the respondents were college or university graduates (51%) and 45.8% of the respondents were on high school. addition, when the survey was conducted, 65.6% of participants had medium computer

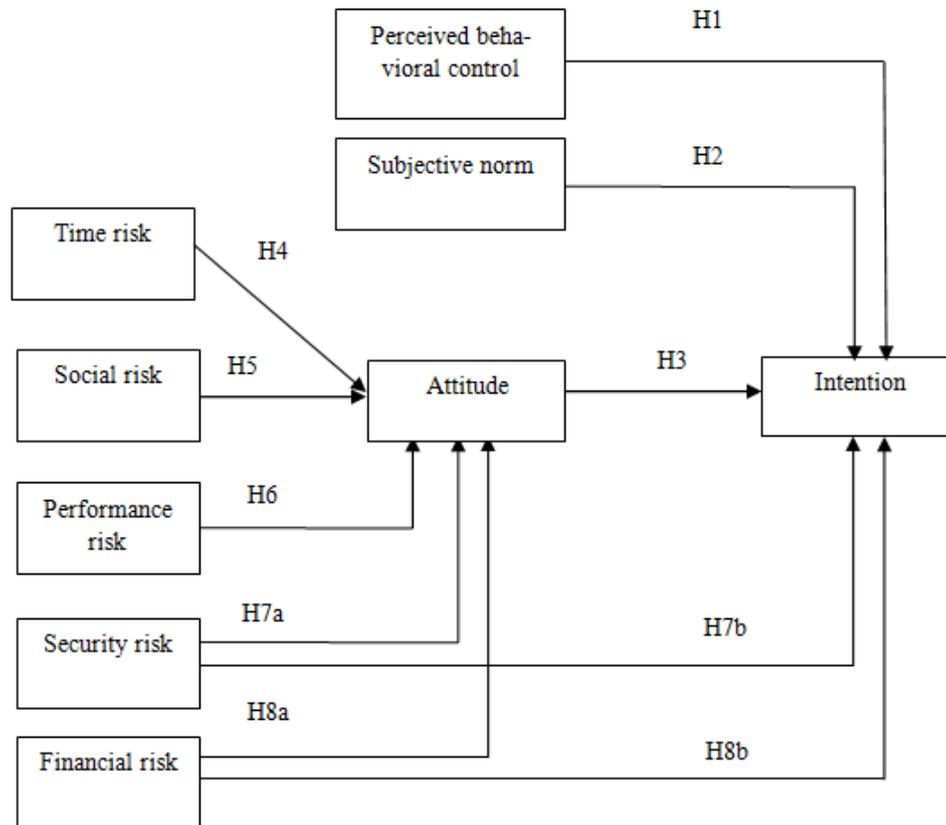


Figure 1. Proposed research model.

Table 2. Summary of research hypothesis.

	Hypothesis	Supporting studies
H ₁	Perceived behavioral control → Intention	Liao et al. (1999); Bhattacharjee(2000); Ajzen (2001); Chau and Hu (2002)
H ₂	Subjective norm → Intention	Ajzen (2001); Liao et al. (1999);Chau and Hu (2002); Bhattacharjee (2000)
H ₃	Attitude → Intention	Davis (1989); Taylor and Todd (1995); Cheng, Lam and Yeung (2006)
H ₄	Time risk → Attitude	Steven , Gerald and Eric (1999);Featherman and Pavlou (2003); Forsythe and Shi (2003)
H ₅	Social risk → Attitude	Dowling and Staelin(1994); Yang and Park(2007)
H ₆	Performance risk → Attitude	Yiu, Grant and Edgar(2007); Littler and Melanthiou (2006); Featherman and Pavlou (2003)
H _{7a}	Security risk → Attitude	Featherman and Pavlou(2003); Forsythe and Shi (2003)
H _{7b}	Security risk → Intention	Featherman and Pavlou(2003); Forsythe and Shi (2003)
H _{8a}	Financial risk → Attitude	Kuisma, Laukkanen and Hiltunen (2007)
H _{8b}	Financial risk → Intention	Kuisma et al. (2007)

Table 3. Sample demographic.

Measure	Item	Frequency	Percent
Gender	Male	276	79.1
	Female	73	20.9
Age	18-26	43	12.3
	27-35	146	41.8
	36-44	130	37.2
	45-53	27	7.7
	54-62	2	0.6
	>62	1	0.3
Education level	High school	160	45.8
	College/university	178	51
	Master	9	2.6
	PhD	2	0.6
Computer usage skill	Very weak	13	3.7
	Weak	39	11.2
	Medium	229	65.6
	Well	51	14.6
	Great	17	4.9
Internet access	Very difficult	10	2.9
	Difficult	34	9.7
	Medium	145	41.5
	Easy	125	35.8
	Very easy	35	10
Internet usage skill	Very weak	34	9.7
	Weak	68	19.5
	Medium	183	52.4
	Well	53	15.2
	Great	11	3.2
using internet per week	less than 3 h	78	22.3
	3- 5 h	180	51.6
	6-10 h	56	16
	11-15 h	24	6.9
	>15 h	11	3.2

usage skill; while only 14.9% of the respondents had very weak or weak computer usage skill. 77.3% of the respondents had medium or easy access to internet and 52.4% of the respondent had medium Internet usage skill while 77.7% had used the Internet for more than 3 hour in each week.

Structural model results

This study used the structural equation modeling (SEM)

for hypotheses testing. The two main reasons for using SEM are: (1) to provide a straightforward method for dealing with multiple relationships simultaneously, while also providing statistical efficiency; and (2) to assess relationships comprehensively (Hair, Tatham, Anderson and Black, 1998). SEM is especially suited for testing a series of relationships constituting a large-scale model or an entire theory. Common criteria for SEM have been previously suggested and the results are presented in Table 5 (Joreskog and Sorbom, 1993). In these results, the structural model presented here indicates adequate fit

Table 4. Research variables and measurements.

Construct	Source
Subjective norms	Taylor and Todd (1995); Wu and Chen(2005)
Perceived behavioral control	Taylor and Todd (1995); Wu and Chen(2005)
Attitude	Taylor and Todd (1995);Davis (1989); Cheng et al.(2006)
Intention	Taylor and Todd (1995); Cheng et al.(2006)
Time risk	Featherman and Pavlou (2003)
Social risk	Featherman and Pavlou (2003)
Performance risk	Featherman and Pavlou (2003)
Security risk	Featherman and Pavlou (2003)
Financial risk	Featherman and Pavlou (2003)

Table 5. Results of the model goodness-of-fit.

Fit index	Recommended criteria	Results in this study
Chi-square/Degree of freedom	< 3	1.86
P value	> 0.05	0.099
GFI (goodness-of-fit index)	> 0.90	0.92
AGFI (adjusted goodness-of-fit index)	> 0.90	0.93
CFI (comparative fit index)	> 0.90	0.91
RMR (root mean squared residual)	< 0.05	0.042
RMSEA (root mean squared error of approximation)	< 0.05	0.043
NFI(Normative Fit Index)	>0.90	0.93

with the observed data, compared with the suggested fit criteria.

Tests of hypotheses

Figure 2 presents results from the path analysis of the combined hypotheses. The first and second hypotheses proposed that perceived behavioral control and subjective norms would be a positive predictor of intention toward the use of internet banking system. The path for H_1 was significant ($\beta = 0.15$, $t = 8.13$), either the path for H_2 was significant ($\beta = 0.13$, $t = 5.41$). Thus, H_1 and H_2 were supported. The third Hypothesis proposed that attitude toward the use of internet banking system would be a positive predictor of intention to use internet banking. The path for this Hypothesis was significant, ($\beta = 0.29$, $t = 3.61$). Therefore Hypothesis 3 was supported. The fourth, fifth and sixth Hypotheses proposed that time risk; social risk and performance risk would be a negative predictor of attitude toward the use of internet banking system. The path for H_4 , ($\beta = -0.12$, $t = 3.65$), the path for H_5 , ($\beta = -0.11$, $t = 2.87$) and the path for Hypothesis 6, ($\beta = -0.14$, $t = 2.63$) were significant. Thus Hypotheses 4, 5 and 6 were all supported. Security risk significantly influenced attitude ($\beta = -0.32$, $t = 6.12$) and intention ($\beta = -0.39$, $t = 5.62$). Consequently, H_{7a} and H_{7b} were supported. Financial risk significantly influenced attitude ($\beta =$

-0.22 , $t = 7.68$) and intention ($\beta = -0.25$, $t = 6.73$). Consequently, Hypotheses 8a and 8b were supported. Summarized results for the hypothesis tests are shown in Table 5. In addition to the tests of hypotheses, direct and indirect effects of each variable are presented in Table 6.

DISCUSSION

The results of this study provide support for the research model presented in Figure 1 and for the hypotheses regarding the directional linkage among the model's variables. Several insightful results could be summarized from research framework, and these are presented below in two categories: positive and negative predictors. Security, financial, time, social and performance risks all emerged as negative factors in the intention to adopt internet banking. First, the intention is adversely affected primarily by security risk ($\beta = -0.39$). Among the five types of perceived risk, Security and financial risk have both significant direct and indirect influences on intention to adopt such services. Security risk appears to be the most important inhibitor to the adoption of internet banking. This underscores the fact that concerns about fraud and identity thefts are foremost in the minds of Internet users. Thus, providing encryption and strong authentication to prevent fraud and identity theft should be a priority in this field. Second, financial risk also has a significant negative

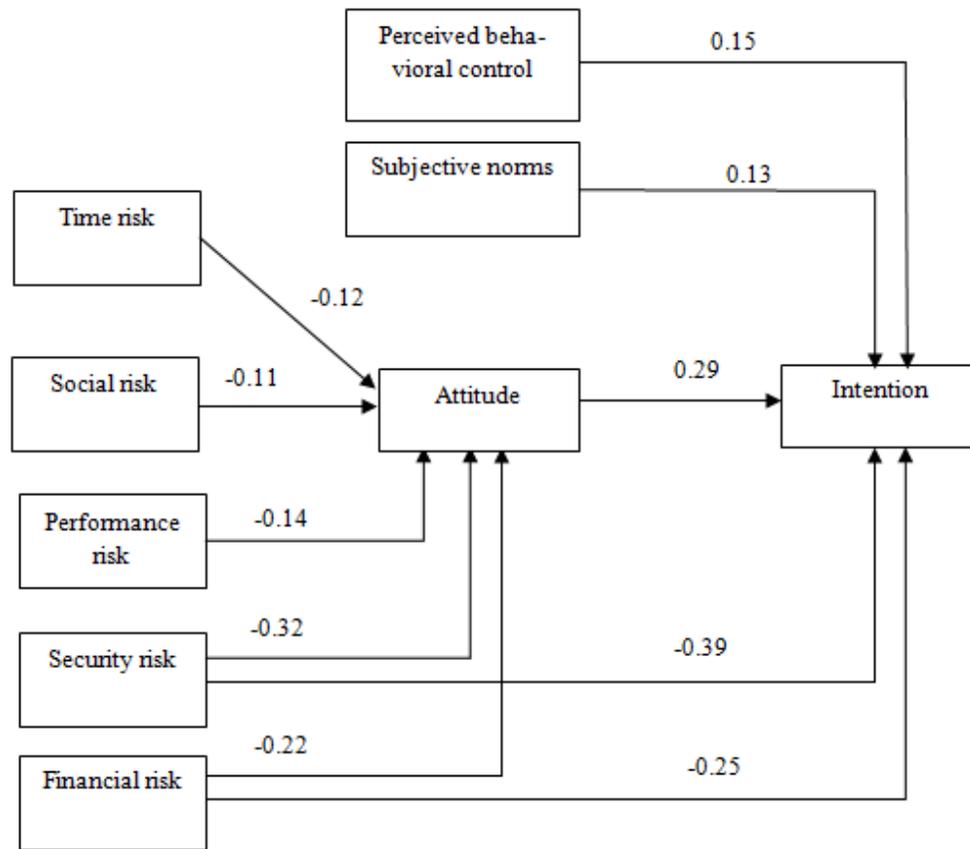


Figure 2. Results from path analysis of the combined hypotheses.

effect ($\beta = -0.25$) on the intention to adopt internet banking and was the second most important inhibitor to the adoption of such services. At present, internet banking transactions lack the assurance provided by staff assistance in traditional settings with the use of formal proceedings and receipts, and because of this customer usually have difficulties in asking for compensation when transaction errors occur. Thus, this may explain why many customers resist adopting internet banking. Third, the results indicate that performance risk has a significant negative influence on attitude ($\beta = -0.22$). Therefore, minimizing the risk of website malfunction might increase the willingness of consumers to conduct transactions online. The fourth finding reveals that the influence of social risk on attitude was significant. This shows that customers are care about social pressure from their friends/family/work group with regard to internet banking.

Fifth, this study found that the time risk to has a negative influence on attitudes towards the intention to adopt internet banking. This implies that internet banking users might worry about delays in receiving online payments and might be concerned with the length of time involved in waiting for the website or learning how to operate it. Thus, reducing the possibility of delays of payment and waiting time is an important issue for internet

banking service providers. On the other hand, compared with the negative factors of perceived risk, the intention to use internet banking is primarily and positively affected by attitude ($\beta = 0.29$) and less so by perceived behavioral control ($\beta = 0.15$) and subjective norms ($\beta = 0.13$). This implies that the attitude is the most important positive predictor of the intention to use internet banking.

Conclusion

This study was conducted to identify determinants of user adoption of internet banking services among citizens of Isfahan province (Iran). The causal relationships among the variables that determine internet banking services adoption were examined. The results show that the proposed model has good explanatory power and confirms its robustness in predicting customers' intentions to use such services. The underlying framework used in this study is the integrated model of the Theory of Perceived Risk and Theory of Planned Behavior. The findings generally supported the hypotheses derived from the model as well as earlier empirical studies.

This study reveals that controlling the risk of internet banking is more important than providing benefits. This

Table 5. Summary of hypothesis tests.

Hypothesis	Support
H ₁ : Perceived behavioral control → Intention	Yes
H ₂ : Subjective norm → Intention	Yes
H ₃ : Attitude → Intention	Yes
H ₄ : Time risk → Attitude	Yes
H ₅ : Social risk → Attitude	Yes
H ₆ : Performance risk → Attitude	Yes
H _{7a} : Security risk → Attitude	Yes
H _{7b} : Security risk → Intention	Yes
H _{8a} : Financial risk → Attitude	Yes
H _{8b} : Financial risk → Intention	Yes

Table 6. Direct, indirect and total effects.

Variable	Effect on					
	Attitude			Intention to use		
	Direct	Indirect	Total	Direct	Indirect	Total
Perceived behavioral control	–	–	–	0.15	–	0.15
Subjective norm	–	–	–	0.13	–	0.13
Time risk	-0.12	–	-0.12	–	–	-0.03
Social risk	-0.11	–	-0.11	–	-0.03	-0.03
Performance risk	-0.14	–	-0.14	–	-0.04	-0.04
Security risk	-0.32	–	-0.32	-0.39	-0.09	-0.48
Financial risk	-0.22	–	-0.22	-0.25	-0.06	-0.31

finding is particularly important for managers as they decide how to allocate resources to retain and expand their current customer base. However, building a risk-free online transaction environment is much more difficult than providing benefits to customers. Therefore, internet banking companies need to search for risk-reducing strategies that might assist in inspiring high confidence in potential customers. This study suggests that they should consider focusing on the prevention of intrusion, fraud and identity theft. For example, building secure firewalls to avoid intrusion, developing methods for strengthening encryption, and authenticating websites in order to prevent fraud and identity theft are all measures that should be undertaken. In addition, this study suggests that internet banking companies could develop trust-building mechanisms to attract customers, such as statements of guarantee, increased familiarity through advertising, and long-term customer service. Internet banking customers usually have difficulty in asking for compensation when transaction errors occur. Thus, this research suggests that internet banking companies should provide customers with digital receipts or a guarantee for every transaction in order to increase confidence in such services.

The present study has many implications for future internet banking research. First, the empirical results

show that the attitude, perceived behavioral control, subjective norm and five risk facets all have significant effects on behavioral intention to use internet banking, where security risk has the biggest negative effect ($\beta = -0.39$). While attitude has the strongest positive effect ($\beta = 0.29$). This result indicates that the risk factor exerts a stronger effect on customers' decision making than the other factor, Second, although previous research has found TAM to be a parsimonious and robust model, it only employs three variables, namely user attitude and two attitudinal beliefs (perceived usefulness and perceived ease of use), to explain behavioral intention. However, a user's behavioral intention will also be affected by other factors, such as the opinions of other important persons (subjective norms) (Fishbein and Ajzen, 1975). Furthermore, even if users have a strong intention to perform a behavior, they will not be able to do so without necessary resources and skills (perceived behavioral control) (Ajzen, 1991). According to Ajzen's research (2002), TPB fills this gap.

Although consumer perceptions of the risks of adopting internet banking have been studied by many researchers (Liao and et al., 1999; Tan and Teo, 2000; Yousafzai, Pallister and Foxall, 2003), the perceived risk variable has only been modeled as a single construct, which fails to reflect the real characteristics of perceived risk and

explain why consumers resist such banking services. This study divides the perceived risk into five facets, consequently providing a more in-depth understanding of the characteristics of such risks regarding internet banking. The theory of planned behavior variables and their integration with these risk facets have been theorized and empirically validated in this work. However, there are significantly different effects on attitude and behavioral intention toward internet banking among the five risk facets, and there remains a considerable amount of work to be done investigating these particularly, as with this research, with regards to internet banking or e-payment acceptance.

REFERENCES

- Ajzen I (1985). From intentions to actions: A theory of planned behavior. In J, Kuhl J, Beckmann (Eds.), *Action control: From cognition to behavior*. New York: Springer-Verlag, pp. 11-39.
- Ajzen I (1991). The theory of planned behavior. *Organ. Behav. Hum. Decis. Process*, 50: 179-211.
- Ajzen I (2001). Nature and operation of attitudes. *Ann. Rev. Psychol.*, 52: 27-58.
- Ajzen I (2002). Perceived behavioral control, self-efficacy, focus of control, and the theory of planned behavior. *J. Appl. Soc. Psychol.*, 32: 1-20.
- Bhattacharjee A (2000). Acceptance of e-commerce services: The case of electronic brokerages. *IEEE Transactions on Systems, Man, and Cybernetics: Part A. Syst. Hum.*, 30(4): 411-420.
- Chau PYK, Hu PJH (2002). Investigating healthcare professionals' decisions to accept telemedicine technology: An empirical test of competing theories. *Inform. Manage.*, 39(4): 297-311.
- Cheng TCE, Lam DYC, Yeung ACL (2006). Adoption of internet banking: an empirical study in Hong Kong. *Decis Support Syst.*, 42(3):1558-72.
- Davis FD (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q.*, 13(3): 319-340.
- Dowling GR, Staelin R (1994). A model of perceived risk and intended risk-handling activity. *J. Consum. Res.*, 21:119-34.
- Featherman MS, Pavlou PA (2003). Predicting e-services adoption: a perceived risk facets perspective. *Int. J. Hum. Comput. Stud.*, 59(4): 451-74.
- Fishbein M, Ajzen I (1975). *Belief, Attitudes, Intention and Behavior: An Introduction to Theory and Research*, Reading MA: Addison-Wesley.
- Forsythe SM, Shi B (2003). Consumer patronage and risk perceptions in internet shopping. *J. Bus. Res.*, 56: 867-75.
- Hair JF, Tatham RL, Anderson RE, Black W (1998). *Multivariate data analysis* (5th ed.). New York, NY Macmillan Publishing Company.
- Hewitt deAC (2001). The development divide in a digital age: An issue paper, *Technology, Business and Society Programmed Paper*. (4): Geneva, Switzerland: The United Nations Research Institute for Social Development.
- Jacoby J, Kaplan LB (1972). The components of perceived risk. In: Venkatesan M, editor. *Advances in consumer research*. Chicago: Association for Consumer Research.
- Joreskog KG, Sorbom D (1993). *LISREL 8: Structural equation modeling with SIMPLIS command language*. Chicago, IL: Scientific Software International; Ibid, 36p.
- Kaplan LB, Szybille GJ (1974). Components of perceived risk in product purchase: a cross validation. *J. Appl. Psychol.*, 59(3): 278-91.
- Kuisma T, Laukkanen T, Hiltunen M (2007). Mapping the reasons for resistance to internet banking: A eans-end approach. *Int. J. Inform. Manage.*, 27(2):75-85.
- Liao S, Shao YP, Wang H, Chen A (1999). The adoption of virtual banking: An empirical study. *Int. J. Inform. Manage.*, 19(1): 63-74.
- Lin WB (2008). Investigation on the model of consumers' perceived risk – integrated viewpoint. *Expert Syst. Appl.*, 34(1): 977-88.
- Little D, Melanthiou D (2006). Consumer perceptions of risk and uncertainty and the implications for behavior towards innovative retail services: the case of internet banking. *J. Retail. Consum. Serv.*, 13(6): 431-43.
- Roselius T (1971). Consumer rankings of risk reduction methods. *J. Mark.*, 35(1): 56-61.
- Steven B, Gerald LL, Eric JJ (1999). Predictors of online buying behavior, association for computing machinery. *Commun. ACM*, 42(12): 32-40.
- Tan M, Teo TSH. (2000). Factors influencing the adoption of internet banking. *J. Assoc. Inform. Syst.*, 1:1-42.
- Taylor S, Todd P (1995). Understanding information technology usage: A test of competing models. *Inform. Syst. Res.*, 6(2), 144-176.
- Venkatesh V, Morris M G, Ackerman PL (2000). A longitudinal field investigation of gender differences in individual technology adoption decision-making processes. *Organ. Behav. Hum. Decis. Proc.*, 83(1): 33-60.
- Wu IL, Chen JL (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 S, Park J (2007). Consumers' channel choice for university-licensed products: exploring factors of consumer acceptance with social identification. *J. Retail. Consum. Serv.*, 14(3): 165-74.
- Yiu CS, Grant K, Edgar D (2007). Factors affecting the adoption of internet banking in Hong Kong – implications for the banking sector. *Int. J. Inform. Manage.*, 27: 336-51.
- Yousafzai SY, Pallister JG, Foxall GR (2003). A proposed model of e-trust for electronic banking. *Technovation*, 23(11): 847-60.