
인터넷뱅킹 요인 결정에 대한 연구

전용진*

A Determination of the Factors Contributing to Internet Banking

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요 약 현재 국내은행 및 외국계은행 이용자는 인터넷뱅킹을 통해 편리하게 조회, 자금이체, 대출신청과 같은 서비스를 이용하고 있고, 이 같은 인터넷뱅킹 이용추세는 증가하고 있다. 본 논문은 인터넷뱅킹 이용과정에 사용자가 중요하다고 생각하는 요인을 결정하고, 각 요인의 상대적 중요도를 파악하고자 한다. 이를 위해 전국적으로 18세 이상 성인을 대상으로 직접 조사하였다. 연구결과 사용 용이성과 유용성, 보안, 흥미, 신뢰성의 네 개의 요인이 확인되었다. 이 결과는 인터넷뱅킹 연구자, 은행의 인터넷뱅킹 서비스를 담당하는 실무자와 정책결정자가 더 나은 서비스를 제공할 수 있는 지침을 제공할 것이다.

주제어 : 인터넷뱅킹, 요인, 용이성, 유용성, 흥미, 신용, 보안

Abstract Seventeen domestic banks, Hongkong & Shanghai Banking Corporation Ltd. and Korea Post provide their subscribers with banking services such as statement service, funds transfer, and application for loans through Internet banking sites, which have become ever-increasing banking services for individual and corporation and government subscribers. First, this study aimed at presenting a process of determining factors to measure customers' perception while using Internet banking for doing transactions. Secondly, this paper attempted to unveil a list of major factors that Internet banking customers perceive while accessing the web sites to do their business with their banks. This study also suggested the features of those factors, which would help improve our understanding of Web usage for Internet banking. This result of the paper will lead further understanding of factors associated with Internet uses in other economic activities, which enable practitioners such as web designers and security specialists to provide Internet banking subscribers with better services in a safe and convenient web pages.

Key Words : Internet banking, factors, ease-of-use, usefulness, enjoyment, trust, security

1. Introduction

As of the end of March 2012, all domestic banks and the Post Office, as well as overseas banks provide Internet banking services such as checking balances, Electronic Funds Transfer (EFT) services, checking foreign exchange, credit card loans, and paying public utility bills.

According to The Bank of Korea[1], the number of

subscribers to Internet banking services was 80.146 million at the end of March 2012. Individual subscribers increased by 15.88 per cent from 65.346 million in March 2011 to 75.724 million in March 2012. Corporation or organization subscribers increased by 19.6 per cent from 3.697 million in March 2011 to 4.422 million in March 2012.

The total volume of Internet banking transactions on daily average basis increased to 45.232 thousand

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transactions, 19.5 per cent up in March 2012 from 37,965 thousand transactions in March 2011.

In the past, there have been many research efforts contributing to evaluating factors associated with the Internet usage, e-commerce, electronic shopping, and internet use for economic activities

These research efforts have been made to find out demographic and motivation variables associated with Internet usage[4,8,37,38], to determine factors in e-commerce[6,7,16,26], to validate constructs of web usage in education and learning[18,19,34], and to examine determinants of influencing internet usage in business domains[2,4,33,36] and online banking[22,32].

This study aimed at presenting a process of determining factors to measure bank subscribers' perception while using Internet banking for doing transactions. Secondly, this paper attempted to unveil a list of major factors that Internet banking customers perceive while accessing the web sites to do their business with their banks. This study also suggested the features of those factors, which would help improve our understanding of Web usage for Internet banking. This result of the paper will lead further understanding of factors associated with Internet uses in other economic activities, thereby enabling researchers and practitioners such as web designers and security specialists to provide Internet banking subscribers with better services in a safe and convenient web pages.

2. Literature Review

2.1 Perceived ease-of-use

Perceived ease-of-use refers to the extent to which the user expects the use of the Web to be user friendly. Since effort is a finite resource that a person may allocate to various activities, it implies that all else being equal, an application perceived to be easier to use than another is more likely to be accepted by users[37].

In general, if the Web is ease-of-use it requires less effort on the part of users, thereby increasing the

likelihood of the Web usage. Conversely, the Web that is complex or difficult to use and control is less likely to be used since it requires significant effort and interest on the part of the user.[18].

In the Past many researchers have unveiled that perceived ease-of-use is related to the Internet usage directly[9,26,28,37]. Lim and Heinrichs(2005) found out that perceived ease-of-use had an impact on e-purchase based on their "Direct Impact".

2.2 Perceived usefulness

Perceived usefulness is defined as the perspective user's subjective belief that using a specific application system will increase his or her job performance within an organizational context[26].

Previous research has found that perceived usefulness has a strong and consistent relationship with the Web usage. As shown by Teo(2001), perceived usefulness was significantly correlated with the Internet usage activities.

Choi and Jahang(2009) measured motivations of usefulness for online commerce with six items, which are five goal oriented motivations(online commerce : convenience, saving time, saving money, less scales pressure, and stay informed) and a hedonic motivation(finding interesting things).

Lim and Heinrichs(2005) unveiled in their "perceived Usefulness Mediated Impact" model that perceived usefulness was specified as a mediator mediating the relationships between the other determinant factors (perceived ease-of-use, perceived enjoyment, and perceived security) and e-purchase.

2.3 Perceived enjoyment

Individuals who experience immediate pleasure and joy from using the Web will be more likely to use it more extensively than others. By extending these results to the context of the Internet, we can therefore postulate that perceived enjoyment would have a positive effect on usage activities.

Perceived enjoyment may be defined as the extent to

which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated [37]. Moon and Kim(2001) unveiled that perception of playfulness appeared to influence user's attitude toward using World Wide Web.

2.4 Perceived trust

Trust has been a object of areas such as psychology, sociology, economics and business. Morgan and Hunt(1994) studied the commitment-trust theory of relationship marketing and pointed out trust was an important factor in relationship marketing.

Within the e-commerce domain of research, trust defined as willingness to believe or an user's beliefs, regarding various attributes of the other party[27]. Recently, a study on trust in electronic shopping conceptualized online trust as the belief that the behavior of an online vender is dependable[5,16].

Some research found that trust is an important factor which has an impact on consumer attitudes towards purchase intentions [3, 17, 21,24, 31, 35]. Ha and Akamavi(2009) studied using a cross-cultural approach and empirically examined the impact of consumer trust on repurchasing intentions through the mediating of variable internet usage in electronic shopping. Kim and Prabhakar(2000) examined trust and perceived risk had an impact on the adoption of Internet banking.

2.4 Perceived security

Security considers as one of the major consumer corns driving to satisfactory and safe experience in economic activities through the Internet such as e-commerce, internet banking, and cyber stock exchange. Customers would hesitate to visit Internet business web sites and to do their business through the Internet if financial information could not be transmitted securely. Many researchers have done their studies on how security influences consumers in online economic activities[10,13,14,35].

Elliot and Fowell(2000) found that many companies doing Internet business recognized that security is one of the main consumer factors for purchasing through the Internet. Lee and Turban(2001) did research on a trust model for customer Internet shopping and unveiled that online infrastructure measures such as security and third-party certification influence customer trust in Internet shopping. Some researchers also found that customer trust and perception of security control have an impact on the acceptance of electronic commerce[31,35].

3. Methodology

3.1 Sample and procedure

The survey was conducted in Seoul, Incheon, Gyungi, Gangwon, Jeonbuk, and Gyungbuk during March through August of 2012. Internet users over 18 years of age were asked to participate.

A total of 255 people were surveyed about their use of internet banking services in person. 54.10% and 45.9% of them are male and female respectively.

To identify independent factors that contribute to Internet banking subscriber attitudes, An explanatory factor analysis was used . For overall sampling adequacy and each indicator's sampling adequacy the study examined Kaiser's measure. To identify and evaluate the factor solution, this study ran the Bartlett's test. Finally to determine if there was any significant difference in the strength among four factors, an ANOVA test was performed.

3.2 Measurement

The instrument adapted in this paper contained question items measuring perceived ease-of-use, perceived usefulness, perceived enjoyment, perceived trust, perceived security. The five constructs were measured by eighteen questions. Also included in this questionnaire were demographics and Internet banking activities items. For this, each respondent was asked

for three age group(less than 29, 30~49, over 50) and Internet banking devices(mobile or computer). Respondents were also asked to report how many years they have used Internet banking and how often they visited Internet banking sites.

The items used in the paper to measure perceived ease-of-use, perceived usefulness, perceived enjoyment were adopted questions in previous papers related to constructs on web usage[4,6,9,18,20,28,37] and modified them for this study on Internet banking. Respondents were questioned to indicate their agreement and disagreement with three items for perceived ease-of-use, four items for perceived usefulness, and three items for perceived enjoyment using five point Likert-type scale (1=strongly disagreement, 5=strongly agree)

Perceived trust was also measured using a five point Likert-type scale (1=strongly disagreement, 5=strongly agreement) adapted earlier studies on economic activities through the Internet[12,15,23,24,25,27,31,35]. Based on the earlier studies, this paper modified question items to measure Internet banking customers' attitude on trust that they have felt while visiting Internet banking web sites. In this paper, perceived trust was measured by four items.

In the middle of developing items measuring perceived security, this paper referred to some previous research on electronic commerce[13,14,26,35]. Perceived security was measured by four items in five point Likert-type scale.

Respondents were asked to indicate their perceived degree of security while doing their banking transactions through Internet banking sites with electronic transaction security such as SSL.

4. Explanatory Factor Analysis

An explanatory factor analysis was used to identify independent factors that contribute to Internet banking subscriber attitudes. During the factor analysis, factors

with Eigenvalue of at least 1.0 were used to access the number of factors to extract. To get a simpler factor structure resulted in each factor representing a distinct construct, the extract method used in this analysis was Principal Component analysis with VARIMAX rotation with Kaiser Normalization.

Eighteen items were hypothesized to measure valid and reliable constructs. In an initial factor analysis, two items whose loadings were 0.543 and 0.576 respectively were dropped from subsequent analyses. In second and third run, two items whose loadings were less than 0.6 were dropped, The fourth and final factor analysis was performed without those items dropped from previous analyses. The resulting factor structure was composed of 12 items measuring four distinct factors which explained 76.964% of the variance(Table 1).

〈Table 1〉 Extraction Sums of Square Loadings

Factors	Eigenvalues	% of the Variance	Cummulative %
Ease*	3.33	27.759	27.759
Security	2.426	20.213	47.971
Enjoyment	1.746	14.550	62.521
Trust	1.733	14.443	76.964

* Ease and Usefulness

This study examined Kaiser's measure of overall sampling adequacy and each indicator's sampling adequacy. The KMO is a means to show the degree to which the indicators of a construct belong together. KMO measure with less than 0.5 is unacceptable. Table 2 shows that the KMO of this analysis was 0.671.

To identify and evaluate the factor solution, this study ran the Bartlett's test which is useful to examine whether or not the correlation matrix is appropriate for factoring. As Table 2 shows, the Bartlett's test statistic was highly significant for this data set.

〈Table 2〉 KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.648
Bartlett's Test of Sphericity	Approx. Chi-Square	847.315
	d.f.	66
	significance	0.000

To access the internal reliability of four factors identified from the explanatory factor analysis, Cronbach coefficient alpha which shows the degree of internal consistency of the constructs were calculated.

As Table 3 shows, all coefficient alpha values exceeded 0.8000 which means factors are considered to be internally consistent. Table 3 also shows the items loading on factors.

〈Table 3〉 Operations of Research variables and Factor Loadings

Items	Ease and Usefulness	Security	Enjoyment	Trust
Doing banking on the web site is easy to me.	0.767			
Learning to do banking on the web site is easy to me.	0.716			
Banking on the web is more convenient than banking in person.	0.891			
Banking on the web leads me to save time.	0.835			
Banking on the web leads me to save on transaction fee.	0.789			
My financial data on the web are fully protected by my bank.		0.875		
Transactions on the web are processed with safety.		0.854		
There is no chance of leaking my information from the web.		0.708		
Using banking site gives me pleasure and enjoyment.			0.876	
Banking site arouses my interest in doing banking on the web.			0.930	
What my banking site says about its products and services is true.				0.936
Information offered by my banking site is sincere and honest.				0.868
Cronbach Alpha	0.871	0.811	0.848	0.827

To determine whether each factors are independent each other, multivariate tests of significance were performed. As table 4 shows the results of four tests,

all four factors turned out to be significant which tells that significant distinctions in the factors exist.

〈Table 4〉 Multivariate Test of Significance

Test names	Value	F	Hypothesis Degree of Freedom	Error of Degree of Freedom	Significance
Pillai's Trace	0.984	3929.887	4	251.000	0.000
Wilk's Lambda	0.016	3929.887	4	251.000	0.000
Hotelling's Trace	62.628	3929.887	4	251.000	0.000
Roy's Largest Root	62.628	3929.887	4	251.000	0.000

5. Ex Post Factor Assessment

To determine if there was any significant difference in the strength among four factors, an ANOVA test was performed, the results of which are presented in Table 5. There was significant difference in factor at the level of 0.05. Among four factors, Ease and Usefulness with the highest mean value(4.1953) was the factor which affected Internet banking the most.

〈Table 5〉 ANOVA between Factors

Factors	Means	F
Ease and Usefulness	4.1953	32.284**
Security	3.0980	
Enjoyment	3.1235	
Trust	3.2000	

To find out if there are significant difference between factors, Tukey HSD test for multiple comparisons was performed. As Table 6 shows, Ease

and Usefulness was different from other three factors in terms of strength of contribution to Internet banking at $p < 0.01$ level and Security was different from Trust at $p < 0.05$ level.

On the other hand, there was no difference between Security and Enjoyment. Between Enjoyment and Trust was there any significant difference.

<Table 6> Turkey HSD Test for Multiple Comparisons

Factors	Means Difference	95% Confidence Level	Sig.
F1 F2	1.09725	1.00131 to 1.19320	0.000
F1 F3	1.07176	0.95023 to 1.19330	0.000
F1 F4	0.99529	0.90349 to 1.08710	0.000
F2 F3	-0.02549	-0.13604 to 0.08506	0.650
F2 F4	-0.10196	-0.19716 to -0.00676	0.036
F3 F4	-0.07647	-0.19579 to 0.04285	0.2086

6. Conclusion

The main objective of this study is to show the process of how to identify some critical factors contributing to Internet banking for further research. Bank customers have several reasons for subscribing Internet banking services and doing their banking on the web sites. This paper investigated previous research on e-commerce, e-retailing, and online education to set eighteen items, based on which this paper extracted four factors by Principal Component factor analysis with VARIMAX rotation, which are Ease and Usefulness, Security, Enjoyment, and Trust.

To check sampling adequacy and internal consistency of the extracted four factors, this paper performed two test such as KMO Measure and Bartlett's test of Sphericity. To check the degree of internal consistency of the constructs Cronbach coefficient alpha were calculated.

To determine if there was any significant difference in the strength among four factors, an ANOVA test was performed. Ease and Usefulness with the highest mean value was the factor which affected Internet

banking the most.

This result of the paper will lead close understanding of factors associated with Internet uses in other economic activities and will also be referred by further research aiming at finding out relationship among motivation, attitude, and intention to reuse in Internet banking. The result also enable practitioners such as web designers and security specialists to provide Internet banking subscribers with better services in a safe and convenient web pages.

References

- [1] Bank of Korea, The (2012), " Use of Internet Banking Services during Q1 2012," <http://ecos.bok.or.kr>, last accessed Aug. 20, 2012.
- [2] Beatty, Robert C., J. P. Shim, and Mary C. Jones (2001), "Factors Influencing Corporate Web Site Adoption: A Time-based Assessment," *Information & Management*, 38, 337-354.
- [3] Bramall, Caroline, Klaus Schoefer and Sally McKechnie (2004), "The Determinants and Consequences of consumer Trust in E-retailing: A Conceptual Framework," *Irish Marketing Review*, 17(1/2), 13-22.
- [4] Chang, Man Kit and Waiman Cheung (2001), "Determinants of the Intention to Use Internet/WWW at work: a Confirmatory Study," *Information & Management*, 39, 1-14.
- [5] Chau, Patric Y. K., Paul Jen-Hwa Hu, Bill L. P. Lee, and Anson K. K. Au (2007), "Examining Customers' Trust in Online Vendors and their Dropout Decisions: An Empirical Study," *Electronic Commerce Research and Application*, 6, 171-182.
- [6] Chiang, Kuan-Pin and Ruby Roy Dholakia (2003), "Factors Driving Consumer Intentions to Shop online: An Empirical Investigation," *Journal of Consumer Psychology*, 13(1/2), 177-183.
- [7] Choi, Junho, and Jungjoo Jahng (2009), "Predictors of E-commerce Use of the Internet: A Multinational Comparative Study-the U.S., the Netherlands, and

- S. Korea", *Seoul Journal of Business*, 15(1), 65-90.
- [8] D'Ambra, John and Ronald E. Rice (2001), "Emerging Factors in User Evaluation of the World Wide Web," *Information & Management*, 38, 373-384.
- [9] Dillon, Thomas W. and Harry L. Reif (2004), "Factors Influencing Consumers' E-commerce Commodity Purchases," *Information Technology, Learning, and Performance Journal*, 22(3), 66-88.
- [10] Doolin, Bill, Stuart Dillon, Fiona Thompson and James L. Corner (2005), "Perceived Risk, the Internet Shopping experience and Online Purchasing Behavior: A New Zealand Perspective," *Journal of Global Information Management*, 13(2), 66-88.
- [11] Elliot, Steve and Sue Fowell (2000), "Expectations versus Reality: A Snapshot of Consumer Experiences with Internet Retailing," *International Journal of Information Management*, 20(5), 323-336.
- [12] Flavian, Carlos, Miguel Guinaliu, and Raquel Gurrea (2006), "the Role Played by Perceived Usability, Satisfaction and Consumer Trust on Website Loyalty," *Information & Management*, 43, 1-14.
- [13] Forchat, Karen A. (1996), "Doing Business on the Internet: Marketing and Security Aspects," *Information Management & Computer Security*, 4(4), 3-9.
- [14] Furnell, Steven M. and T. Kaweni (1999), "Security Implications of Electronic Commerce: A Survey of consumers and Business," *Internet Research*, 9(5), 372-382.
- [15] Grabner-Krauter, Sonja (2002), "The Role of Consumers Trust in Online Shopping," *Journal of Business Ethics*, 39, 43-50.
- [16] Ha, Hong-Youl and Raphael K. Akamavi (2009), "Does Trust Really Matter in Electronic Shopping?," *Seoul Journal of Business*, 15(1), 91-120.
- [17] Heijden, Hans van der, Tibert Verhagen, and Marcel Creemers (2003), "Understanding Online Purchasing Intentions: Contributions from Technology and Trust Perspectives," *European Journal of Information Systems*, 12, 41-48.
- [18] John, Yongjean (2010), "Validating Constructs of Web Usage in Education and Learning," *The Journal of Digital Policy & Management*, 8(4), 109-121.
- [19] John, Yongjean (2011), "Relationship between Motivations and Performances on the Internet Use," *The Journal of Digital Policy & Management*, 9(4), 109-121.
- [20] Joins, Jessica L., Clifford W. Scherer, and Dietram A. Scherer (2003), "Exploring Motivations for Consumer Web Use and Their Implications for E-commerce," *Journal of Consumer Marketing*, 20(2), 90-108.
- [21] Keat, Teoh Kung and Avvari Mohan (2004), "Integration of TAM Based Electronic Commerce Models for Trust," *Journal of American Academy of Business*, 5(1/2), 404-410.
- [22] Kim, Kyu and Bipin Prabhakar (2000), "Initial Trust, Perceived Risk and the Adoption of Internet Banking," *Proceedings of the Twenty First International Conference on Information Systems*, 537-543.
- [23] Koehn, Daryl (2003) "The Nature of and Conditions for Online Trust," *Journal of Business Ethics*, 43, 3-19.
- [24] Lee, Matthew K. O. and Efraim Turban (2001), "A Trust Model for Consumer Internet Shopping," *International Journal of Electronic Commerce*, 6(1), 75-91.
- [25] Lewicki, Roy J. and Barbara B. Bunker (1995), "Trust in Relationship: A Model of Trust Development and Decline," In *Conflict, Cooperation and Justice*, B. Bunker and J. Rubin eds., Ca, Jossey-Bass, 133-173.
- [26] Lim, Kee-Sook, Jeon-Su Lim, and John H. Heinrichs (2005), "Structural Model Comparison of the Determining Factors for E-Purchase," *Seoul Journal of Business*, 11(2), Dec., pp.119-143.
- [27] McKnight, D. Harrison and N. L. Chervany (2002), "What Trust Means in E-commerce Customer

- Relationships: An Interdisciplinary Conceptual Typology," *International Journal of Electronic Commerce*, 6(2), 35-59.
- [28] Monsuwe, Tonita Pereay, Benedict G. C. Dellaert, and Ko de Ruyter (2004), "What Drives Consumers to Shop Online? A Literature Review," *International Journal of Service Industry Management*, 15(1), 102-121.
- [29] Moon, Ji-Won and Young-Gul Kim (2001), "Extending the TAM for a World-Wide-Web Context," *Information & Management*, Vol.38, pp.217-230.
- [30] Morgan, Robert M. and Shelby D. Hunt(1994), "The Commitment-Trust Theory of Relationship Marketing," *Journal of Marketing*, 58(3), 20-38.
- [31] Pavlou, Paul A. (2003), "Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the Technology Acceptance Model," *International Journal of Electronic Commerce*, 7(3), 101-1341.
- [32] Pikkarainen, Tero, Kari Pikkarainen, Hekki Karjaluoto and Seppo Pahlila (2004), "Consumer Acceptance of Online Banking: An Extention of the Technology Acceptance Model," *Internet Research*, 14(3), 224-235.
- [33] Ranchhod, A., F. Zhou, and J. Tinson (2001), "Factors Influencing Marketing Effectiveness on the Web," *Information Resource Management Journal*, 14(1), 4-12.
- [34] Selim, Hassan M.(2007), "Critical Success Factors for E-learning Acceptance: Confirmatory Factor Models," *Computer & Education*, 49(2), 396-413.
- [35] Shu, Bomil and Ingoo Han (2003), "The Impact of Consumer Trust and Perception of Security Control on the Acceptance of Electronic Commerce," *International Journal of Electronic Commerce*, 7(3), 135-152.
- [36] Stafford, Thomas F. and Marla Royne Stafford (2001), "Identifying Motivations for the Use of Commercial Web Sites," *Information resources Management Journal*, 14(1), 22-30.
- [37] Teo, Thompson S.H. (2001), "Demographic and

Motivation Variables Associated with Internet Usage Activities", *Internet Research: Electronic Networking Applications and Policy*, 11(2), 125-137.

- [38] Teo, Thomson S. H. and Wing Yee Choo (2001), "Assessing the Impact of Using the Internet for Competitive Intelligence," *Information & Management*, 39, 67-83.

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