Internet Banking Adoption Factors in Finland

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Abstract

This paper finds out factors which have defined consumers' adoption of Internet
banking in Finland. Finland is a world leader in electronic banking, and over 39.8
percent of all the banking transactions were made over the Internet. Using the data of a
large survey, we develop a cognitive model of the factors which affect the adoption of
Internet banking. Prior technology experience, personal banking experience, reference
group influence, and security concerns are found to be the main factors, and
demographic characteristics and overall perceptions about Internet banking were found
to have a significant effect on the adoption.

Introduction

Several studies suggest that the Internet has become a popular delivery platform for electronic banking
(Sheshunoff, 2000; Oyegoke, 1999; Birch, 1999; Evans and Wurster, 1997). Personal banking is no
longer time nor location bounded. Electronic banking customers are offered an easy access to their
accounts 24 hours per day, seven days a week. Regardless of this convenience, adoption rates of
electronic banking in most countries have been very low. Only the banks in Finland report that most of
their customers regularly bank over the Internet, and that over 70 percent visit a bank branch less than 2
times per year. It is, therefore, of interest to ascertain and understand the factors that drive Finnish bank
customers online.

As the consumer behavior on the Internet still remains a rather uncharted territory, this study is founded on
traditional attitude-behavior modeling. We first gathered factors that we thought *a priori* to influence the
adoption of Internet banking either positively or negatively. We then collected data with a large mail
survey, and further verified this data with in-depth interviews. The theory of reasoned action by Ajzen and
Fishbein (1980) and technology acceptance model by Davis et al. (1989) provide the foundation of our
attitude-behavior model of consumers? Internet banking. We also study the effect of demographic factors
on the adoption rate.

Literature review

Individual differences in consumer behavior have been found to be associated with the acceptance of new information technologies such as Internet banking (see e.g., Zmud 1979; Nelson, 1990; Crisp et al., 1997). A typical Internet banking user is found to be a highly educated, young, and a relatively wealthy person with a good understanding of computers and especially the Internet. It has been also reported that demographic factors have a great impact on consumers' perceptions and intentions toward Internet banking (Daniel, 1999; Sathye, 1999; Jayawardhena and Foley, 2000; Karjaluoto et al., 2001).

Technology experience

Prior technology experience, especially prior computer experience have been found to impact consumers' beliefs about related systems and information technology (DeLone, 1988; Igbaria et al., 1995). Au et al. (2000) extended this idea tot he observation that the more experience consumer has about technology, the better will she understand new technologies and their ramifications. Thus, consumer's familiarity with technologies in general facilitates her appreciation of the potential added value which is inherent in a technology.

Trocchia and Janda (2000) introduce this logic to the realm of the Internet by arguing that consumers' adoption rate of the Internet is associated with their past experiences with the technologies. Non-users' negative experiences were suggested to have a great impact on their perceptions about the Internet. This logic is in line with the classic attitude theories of Fishbein and Ajzen (1975, p.14), who claim that the more positive the person's past experience about an object is, the more positive beliefs he will hold about it. As a result, the positive beliefs create positive perceptions.

Fisher (2000) corroborates this by proposing that the most important reason for adopting Internet based services is '*each consumer's attitude toward technology itself, raging from eagerly accepting to profoundly suspicious*'. A direct consequence of these earlier studies is the hypothesis that *a negative prior technology experience and especially negative computer experience, has a negative impact on the adoption of Internet banking, and vice versa.* This hypothesis will be empirically tested below.

Personal banking experience

Consumer behavior research has also studied the relationship between a person's experiences onto her behavior. In general, beliefs and attitudes are largely the result of personal experiences about a given object (see e.g. Fishbein and Ajzen, 1975, p.10; Peter and Olson, 1990, p.142). We hypothesize that *satisfied bank customers have more positive perceptions also about Internet banking and, thus, are more likely to move online.* A dissatisfied branch office customer may try Internet banking, but only a satisfied customers adopt Internet banking as their regular bill payment mode.

Reference group influence

Consumer behavior literature also suggests that reference groups, such as a social reference group, may impact on person's behavior (Fishbein, 1967, p.477; Fishbein and Ajzen, 1975, p.495). Two competing influences have been identified on the relationship between subjective norm and behavior: conformity and dissension (Snyder and Fromkin, 1977; Baumeister, 1982; Guerin, 1986; Simonson and Nowlis, 2000). Conformity is the result of people trying to conform to a subjective norm, thereby avoiding criticism and rejection.

Dissension measures consumer's independence of the subjective norm, and is a reflection of strong self-

respect and autonomy. A dissenting consumer is thus an individual, unique, special, and separable from the masses (Snyder, 1992). The central role of the subjective norm in consumers' behavior has been empirically verified from several angles. Bagozzi (2000) has shown that when the subjective norm is measured by social factors and focus, it is a strong determinant of consumer behavior. On the other hand, Taylor (1991, p.55) argues that most people try to surround themselves with people and things that are consistent with their own identities.

The consumption of banking services may be influenced by several reference groups of the customer such as the personnel of the bank and traditional ones such as friends and family. We hypothesize that *reference groups do influence the adoption of Internet banking*, and modify the hypothesis with the statement that even if Internet banking usage may be initiated by a certain reference group such as banking personnel, the continuance of the use of Internet banking depends more on other factors, mainly customer's perception about technology in general.

Security challenges

One of the most significant challenges of Internet banking has been consumers' security concerns about Internet banking. Security has been identified as one of the biggest barriers for the uptake of Internet banking (see e.g. Sathye, 1999). Mattila's (2001, p.129-133) empirical study points out that Finnish Internet banking customers do not pay excessive attention to security concerns. We continue this line of thought and hypothesize that *security concerns have no impact on the adoption of Internet banking*.

Demographics

The effect of demographics has been found to be very a significant determinant of behavior in various studies concerning electronic banking. High income, relatively young age, and good education have been found explaining the acceptance of Internet banking. In addition, a typical Internet banking user has been identified as a high involvement person belonging to the upper middle class or in parts as a member of the career-orientated upper middle class (Roemer and Buhl, 1996; Jayawardhena and Foley, 2000).

The technology acceptance literature points a strong relationship between age and the acceptance of new technologies (e.g. Gattiker, 1992; Harrison et al., 1992). Older consumers are found to have problems with new technologies, and hence, are expected to have negative attitudes toward innovations. Trocchia and Janda (2000), for instance, indicate that many older consumers possess more negative intention to change. However, they argue that person's overall perception of technology affects more than the age.

Gender has also been suggested as a factor of Internet banking adoption. Some studies argue that the Internet is male dominated (e.g. Computer Industry Almanac, 2000). In Finland the latest research counts that 45 percent of the Internet users are female (Statistics Finland, 2000). We are interested in examining whether demographic variables such as *age, education, profession, and household income have an influence on Internet banking usage*.

Perceptions' relationship to behavior

Attitudes put people into a frame of mind of liking or disliking things, of moving toward or away from them. In other words, overall perceptions about Internet banking are expected to divide consumers into non-users and users. Moreover, we believe that especially computer perceptions have an effect on Internet banking usage.

We conducted an extensive literature review in the area of attitude development and attitude-behavior relationships in order to develop our model. Models such as the theory of reasoned action (Ajzen and

Fishbein, 1980) and the technology acceptance model (Davis et al., 1989) have influenced our model. However, we used abductive reasoning in the model development, i.e. the development is based on both theoretical background and empirical findings. The model is expected to provide a practical tool for understanding the factors that drive the adoption of Internet banking.

Research methodology

The data of this research was collected by means of a questionnaire sent by mail to 3000 individual bank customers in Finland. After a follow-up round a total of 1201 questionnaires were received of which 1167 were used in the data analysis. The response rate was 38.9 percent. The survey sample consisted of three consumer segments (non-users, new users, old users) that differed in terms of Internet banking experience. Thus, the questionnaire was also partly tailored. However, in this particular paper, the data is mainly analyzed as one, i.e. only non-users are analyzed separately in the latter part of this paper.

Results

Consumers' use of online banking services in Finland is the highest in the world. Nordea has 1.4 million online customers, and 3.2 million log-ons monthly. Osuuspankki Group is the second largest bank group in Finland with 500 000 online customers. All the banks offer a full line of Internet services: basic banking services, stock and bond trading, loan applications, consumption and education loan decisions, electronic bill presentment, international payments, and electronic salary presentment.

The demographics in table 1 show that the respondents of the sample are quite representative of the population in Finland on several variables (for more information see www.stat.fi. However, the age distribution of this sample differs from the national one by being more older people oriented. The age mode of our sample was between 35-49 years whereas 22.4 percent of Finnish population belong in this age group. Less than one percent in our sample were under 24 years compared to 30.6 percent of the total population. This difference may be partially explained by the fact that many young bank customers were not reached at their permanent address, to which the questionnaire was sent. Also one must keep in mind that only few children or teenagers actually own their own bank account, and therefore they may not be listed as customers in the bank's customer database.

The income of the respondents was also somewhat higher than that of the nation's consumers, but this is explained by the fact that the stratified sample intentionally produced an overrepresentation of the users of Internet banking, and these users tend to have more income. Over 42 % of all respondents had an annual income over 37842e whereas the national average annual income was 25380e year 2000.

Table 1. Profile of respondents

Demographic characteristics	Frequency	Percentage	Valid percent	Cumulative percentage
Gender				
Male	601	51.4	51.5	51.5
Female	565	48.3	48.5	100.0
Missing	1	0.1		
Total	1167	100.0		
Age				
Under 34 years of age	128	11.0	11.0	11.0
35-49 years	459	39.3	39.4	50.3
50-64 years	369	31.6	31.6	82.0
65 years and over	210	18.0	18.0	100.0

Missing	1	0.1		
Total	1167	100.0		
Household Income				
Less than 16 819e	206	17.6	18.3	18.3
16 820-25 228e	201	17.2	17.8	36.1
25 229-37 842e	231	19.7	20.5	56.5
More than 37 843e	491	42.0	43.5	100.0
Missing	38	3.5		
Total	1167	100.0		
Marital status				
Married	680	58.1	58.6	58.6
Not married	481	41.1	41.4	88.2
Missing	6	0.8		
Total	1167	100.0		
Profession				
Leading position	565	48.4	48.6	48.6
Worker	237	20.3	20.4	69.0
Not at work	361	30.9	31.0	100.0
Missing	4	0.3		
Total	1167	100.0		

At the time of the questionnaire, most of the respondents (39.8%) already paid their bills over the Internet. Only 12.1 % paid at a branch, and telephone banking was used even less (3.1%). Considering the very high penetration of mobile WAP telephones in Finland, it was surprising that mobile banking via WAP is not very common in Finland.   The use rate of Internet should be considered very high, as only 57,8 % of the respondents had a PC and an access to the net.

Table 2. Technology access

% Don't use Mobile Phone in Banking		96.8 %
% Uses Mobile Phone in Banking		3.2 %
	WAP	25.0 %
	Text message	11.1 %
	Call to Telephone bank	63.8%
Standard deviation	0.4513	
% No Computer		36.5 %
% has a Computer		63.5 %
	At home	83.0 %
	At work	40.8 %
	Other	4.6 %
Standard deviation	0.8142	
% without Internet Access		42.2 %
% with Internet Access		57.8 %
% Accessing Internet fromâ€¦	Home	51.3 %
	Office	45.5 %
	Other	3.2 %
Standard deviation	0.8485	

A factor analysis of the correlations between selected variables of our survey was conducted to develop a

cognitive model of Internet bank adoption. Factor analysis was deemed a suitable method because the Kaisers-Meyer-Olkin (KMO) score of sampling adequacy (0.853) was well above the 0.5 recommendation level (Malhorta, 1999), and the Bartlett test of sphericity (0,000) indicated that there was adequate correlation among the chosen variables. Four factors were identified using principal axis factoring and Varimax rotation (see e.g. Alexander and Colgate, 2000), and by applying the rule that factors, which have an eigenvalue larger than 1.0 should be included (Hair et al. 1995, Alfansi and Sargeant 2000).   The four factors identified explained 55.7 percent of the total variance.

The first factor, prior computer experience, has heavy loadings for five variables, which all relate to consumers' perception of computer-related technologies. Non-users score low and old users score high on this factor. Factor two, prior technology experience has loadings for five variables, which relate to consumers' of technology in general. Surprisingly, we found out that non-users scored quite high on this factor. The difference between non-users and users was that the non-users liked teletext and ATM and users disliked them. The third factor, personal banking experience, has high loadings for four variables which all have to do with user-friendliness and speed. The last factor, reference group influence pertains to three variables on consumers' reaction to the subjective norm regarding whether they should perform a certain behavior or not.

Table 3. Factor analysis of Internet banking adoption barriers

Statement	Factors			
	Prior computer experience	Prior technology experience	Personal banking experience	Reference group influence
Internet	.857			
E-mail	.847			
Computer	.795			
E-payment	.498			
Mobile phones and services	.439			
Automates		.766		
Electric ID card		.547		
ATM		.529		
Teletext		.448		
Liking of improvements		.353		
Speed			.684	
Easy of use			.629	
Trustworthiness and security			.440	
Free from time and place			.418	
Social contacts				.652
Referents' example				.348
Group behavior				.312
Initial eigenvalues	4.909	1.784	1.635	1.139
Total variance explained %	28.876	10.492	9.617	6.697

Notes: Extraction method: Principal Axis Factoring

Rotation Method: Varimax with Kaiser Normalization

Our model of the factors, which affect consumers' adoption of Internet banking, is based on the literature review and the factor analysis results above, see Figure 1. The model is constructed using both inductive

and deductive reasoning, and is built on the premise that three factors, *prior technology experience* ("=0.70) including *computer perception* ("=0.90) and *prior computer experience* ("=0.88), *personal banking experience* (" =0.67), and *reference group influence* ("=0.61) do influence Internet banking behavior. In addition, the model indicates a strong relationship between overall perceptions about Internet banking ("=0.78) and the Internet banking usage. Overall perceptions toward Internet banking was measured based on the outcomes of the factors.

The construction of the model by induction from quantitative data may set a limit to its applicability. A more accurate verification of the model by using our qualitative data from conducted in-depth interviews is included in figure 1. Another limitation of this model is that its data is derived from one sample, and has not been tested with different consumer groups. While non-users and users differ in many parts, the factors in the model may have quite different loadings for different consumer segments.

Figure 1. A cognitive model of the adoption of Internet banking

Notes:

** Correlation is significant at the 0.01 level (2-tailed);* Correlation is significant at the 0.05 level (2-tailed); Correlation was measured using Pearson and Spearman's rho

To further investigate the relationships we calculated correlations between the factors and actual Internet

banking usage. Computer perception variables and demographics, as well as overall perceptions toward Internet banking were added to the correlation matrix highlight the importance of individual differences in Internet banking. Relatively high correlations were found between Internet banking usage and the factors, and the demographics, see table 4.

Table 4. Correlation matrix

Variable	Correlation coefficients													
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.Internet banking usage	1.000													
2.Prior computer experience	.610**	1.000												
3.Prior technology experience	.017	.115**	1.000											
4.Personal banking experience	.207**	.062	.043	1.000										
5.Reference group influence	-.339**	.106**	.036	-.045	1.000									
6.Computer perception	.650**	.903**	.250**	.163**	-.187**	1.000								
Demographics														
7.Gender	-.129**	-.100*	.035	.253**	.061	-.086**	1.000							
8.Age	-.414**	-.245**	-.037	-.019	.065	-.325**	.007	1.000						
9.Marital status	-.227**	-.056	-.007	-.031	.139**	-.123**	.097**	.091**	1.000					
10.Education	.360**	.192**	.021	.014	-.224**	.263**	-.030	-.246**	-.126**	1.000				
11.Profession	.527**	.352**	.033	.130**	-.195**	.388**	-.049	-.484**	-.196**	.375**	1.000			
12.Household income	.546**	.325**	-.024	.140**	-.293**	.385**	-.162**	-.292**	-.425**	.409**	.542**	1.000		
13.Household size	.213**	.064	.062	.051	-.066	.125**	-.063*	-.134**	-.740**	.103**	.191**	.355**	1.000	
14. Overall perceptions	.524**	.762**	.499**	.404**	-.097*	.828**	.010	-.197**	-.070	.150**	.289**	.266**	.104**	1.000

Notes:

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Correlation was measured using Pearson and Spearman's rho (non-parametric correlations displayed in gray)

Prior computer experience correlates positively with Internet banking usage (r=.610, p<0.01), prior technology experience (r=.115, p<0.01), computer perception (r=.903, p<0.01), education (r=192, p<0.01), profession (r=.352, p<0.01), household income (r=.325, p<0.01), and overall perceptions toward Internet banking (r=.762, p<0.01). Conversely, prior computer experience correlates negatively with reference group influence (r= -.106, p<0.01), and age (r= -.245, p<0.01). Thus, prior computer experience seems to be very good predictor of consumers' adoption of Internet banking. This finding is supported by the previous studies (see e.g. Crisp et al., 1997).

Prior technology experience and demographics and Internet banking usage were not correlated, as was expected *a priori*. However, a positive correlation was found between prior technology experience and prior computer experience (r=.115, p<0.01), computer perception (r=.250, p<0.01), and overall perceptions toward Internet banking (r=.499, p<0.01).

Furthermore, personal banking experience correlates positively with Internet banking usage (r=.207, p<0.01), computer perception (r=.163, p<0.01), gender (r=.253, p<0.01), profession (r=.130, p<0.01), household income (r=.140, p<0.01), and overall perceptions toward Internet banking (r=.404, p<0.01). This implies that personal banking experience mediates consumers' adoption of Internet banking. It tends to influence more professionals who have positive computer perceptions than women with negative perceptions about Internet banking.

Negative correlations were found between the reference group influence, and Internet banking usage (r= -.339, p<0.01), prior computer experience (r= -.106, p<0.01), computer perception (r= -.187, p<0.01), education (r= -224, p<0.01), profession (r= -.195, p<0.01), household income (r= -.293, p<0.01), and overall perceptions about Internet banking (r= -.097, p<0.05). These results indicate that wealthier consumers are less susceptible to reference group influence when switching their banking to the Internet. No positive correlation was found between this factor and other variables.

Computer perception and Internet banking usage are also correlated (r=.650, p<0.01), and computer perception correlates positively with prior computer experience (r=.903, p<0.01), prior technology experience (r=.250, p<0.01), personal banking experience (r=.163, p<0.01), education (r=.263, p<0.01), profession (r=.388, p<0.01), household income (r=.385, p<0.01), household size (r=.125, p<0.01), and overall perceptions about Internet banking (r=.828, p<0.01). Negative correlation was found between computer perception and reference group influence (r=.187, p<0.01), gender (r=. â€'086, p<0.01), age (r= -.325, p<0.01), and marital status (r= -.123, p<0.01).

A most important relation is derived from the high correlations, which were found between Internet banking usage and the other variables. As already partly stated, Internet banking usage correlates positively with prior computer experience (r=.610, p<0.01), personal banking experience (r=.207, p<0.01), computer perception (r=.650, p<0.01), education (r=.306, p<0.01), profession (r=.527, p<0.01), household income (r=.546, p<0.01), household size (r=.213, p<0.01), and attitude (r=.524, p<0.01). Internet banking usage is negatively correlated with reference group influence (r= -.339, p<0.01), gender (r= -.129, p<0.01), age (r= -.414, p<0.01), and marital status (r= -.227, p<0.01). These results imply a strong relationship between demographic characteristics and Internet banking usage. Our results suggest that the adoption of Internet banking depends heavily on the factors outlined in figure 1.

Regression results on intention to use Internet banking

In our regression model, the response variable is intention to use Internet banking, which was measured using a three-point scale ranging from never to often. Predictor variables were chosen by first selecting variables, which correlate highly with the response variable, and then reducing multicollinearity in the model statistical choice methods suggested in the literature (Draper and Smith, 1981: Nummenmaa et al.

1997, p.310).

Table 5. Regression coefficients model on intention(a)

Independent variable	Unstandardized Coefficients		Standardized coefficients		
	B	S.E.	Beta		
				t-test	Significant level
(Constant)	.352	.085		4.122	.000
Computer perception	.422	.030	.452	14.293	.000
Profession	.208	.039	.175	5.324	.000
Reference group influence	-.213	.038	-.172	-5.612	.000
Household income	.191	.041	.158	4.703	.000
Personal banking experience	0.00	.033	.080	2.697	.007

Notes:

a. Dependent variable: Internet banking usage

The regression results displayed in table 5 suggest that computer perception, profession, and household income, have the strongest impact on consumers' intention to use Internet banking. In contrast, reference group influence impacts negatively. Our data explains this with the fact, that whereas the banking personnel may still be most important reference group in initiating the use of Internet banking, customer's own perceptions about technology, and Internet banking mold there final behavior along with the social reference groups' example.

The regression results indicate that profession and household income have a significant impact on the intention to use Internet banking. Additionally, high positive correlations were found between usage and education (r=.360), profession (r=.527), and household income (r=.213). On the contrary, high negative correlation was found between usage rate and age (r= -.414), gender (r= -.129), and marital status (r= -.227) All correlation coefficients were significant, p<0.01. Thus, our results suggest a typical user to be male, relatively young, well-educated, family man, in a good profession.

Barriers of adoption among non-users

To develop more insight into how consumers perceive Internet banking, a second factor analysis was carried out using the 350 respondents who do not use Internet for their banking. We used the same method in this factor analysis as in the first one. The factor loadings are presented in table 6.

Five factors were derived using the same techniques as above. Bartlett's test value (0,000) and the Kaiser-Meyer-Olkin (KMO) score (0.512) confirmed sufficient correlation among the variables in the factors. The five factor model explained 76.9 percent of the total variance. The factors are: (1) Importance of new service dimensions in Internet banking, (2) Negative word-of-mouth, (3) Security concerns and other barriers for usage, (4) Less personal workload in Internet banking, (5) Time-consuming. Gronbach's alphas of the factors point out that the internal reliability of the results can be considered sufficient.

The first factor, importance of new service dimensions, refers to new enhancement of Internet banking

portal. Seven variables concerning added services loaded this factor. Second factor, negative word-of-mouth, refers simply to the negative grapevine. Among non-users, reference group influence is expected to impact negatively on intention to Internet banking. The factor three can be called security concerns and other usage barriers as the variables loading the factor all refer to significant barriers concerning expenditures, security, and lack of service. The fourth factor can be called workload, because variables loaded this factor refer to less workload. The final factor is called time consuming, as it relates to the time dimension of Internet banking. The effort to learn the practical use of Internet banking is considered quite time consuming among non-users, as we will soon demonstrate.

Table 6. Rotated factor matrix

Non-users' perception of Internet banking	F1	F2	F3	F4	F5
Gronbach's Alpha	0.89	0.81	0.78	0.81	0.64
I would use the Internet bank if I could					
Draw money at home or load money on bankcard	.913				
Count personal budget via Internet	.865				
Pay e-commerce bills	.800				
Pay bills faster	.747				
Get bonus from transactions	.729				
Pay bills cheaper	.716				
Have personal education	.649				
Have complete loan services via Internet				.822	
Have less personal workload in e.g. bill payment				.538	
I don't use Internet bank because					
Use has been a disappointment		.870			
Friends and relatives neither use it		.788			
Heard it is complicated		.717			
Security concerns			.796		
Expensive start up			.777		
Internet banking provides no paper quittance after payment			.577		
Internet banking provides no personal service			.538		
Internet banking is time consuming					.587
Use of computers / Internet is time consuming					.555
Initial eigenvalues	6.52	4.70	1.77	1.35	1.04
Total variance explained %	28.9	10.5	9.6	6.7	5.2

Notes:

Extraction method: Principal Axis Factoring

Rotation Method: Varimax with Kaiser Normalization

Table 7 shows the summary of means of the variables, all of which were derived from a 7-point Likert scale from -3 (not at all important / strongly disagree) to 3 (very important / strongly agree).

Table 7. Summary of means

Attribute	Importance means	Std.Deviation

I would use the Internet bank if I could

Draw money at home or load money on bankcard	-1.26	2.24
Count personal budget via Internet	-1.72	1.94
Pay e-commerce bills	-1.75	1.93
Pay bills faster	-1.63	2.12
Get bonus from transactions	-0.51	2.49
Pay bills cheaper	-0.39	2.51
Have personal education	-0.73	2.44
Have complete loan services via Internet	-1.70	1.93
Have less personal workload in e.g. bill payment	-0.68	2.41

Notes: Scale (-3) not at all important to (3) Very important

I don't use Internet bank because

Use has been a disappointment	-1.71	1.94
Friends and relatives neither use it	-1.59	2.01
Heard it is complicated	-0.45	2.24
Security concerns	0.31	2.23
Expensive start up	-0.38	2.35
Internet banking provides no paper quittance after payment	0.01	2.34
Internet banking provides no personal service	0.71	2.42
Internet banking is time consuming	-0.46	2.24
Use of computers / Internet is time consuming	0.39	2.49

Notes: Scale (-3) strongly disagree to (3) strongly agree

Results presented in table 7 indicate that the main barrier for the adoption of Internet banking among non-users is the lack of personal service (mean 0.71), time-consuming (mean 0.39) and security concerns (mean 0.31). New service dimensions in Internet banking (factor 1) was loaded with negative mean scores. Hence, non-users do not find new services in Internet banking important, and they are not aware of the current services available in Internet banking either. This is obvious, because most of the non-users do not possess a computer to start with and are therefore unable to access Internet banking.

Total amount of 84.4 percent of the respondents considered Internet banking very secure, and 10.5 percent quite secure. Non-users were more skeptical about the security of Internet banking, possibly because in our sample they were elderly people, with less education and little computer experience.

Non-users rated the security of Internet banking on a scale from very minor barrier of adoption (-3) to a very significant barrier of adoption (3). The results suggest that 26.4 percent of the non-users found the security of Internet banking as a very important barrier to their Internet banking usage and 9.9 percent find it as a quite important barrier.

We conducted ANOVA tests to define the security concerns of non-users further. In these tests, age had no significant impact on the security concerns, but household income had a small negative and education had a small positive influence in security concerns.

Conclusions

The typical user (=mode) of Internet banking in our study was found to be a well-educated (= college) male professional between 35 and 40 years of age. This segment is a most interesting one for retail

bankers, for these are the prime customers, much more than the typical (=mode) non-users who are less-educated (=high school or less) females over 50 years of age.   This shows that simple demographics are practicable in planning campaigns for getting people to transfer their banking to the Internet.

Another relevant factor in the adoption process is consumer's experience with computers. People who are experienced with computers think positively about them and have positive perceptions about Internet banking. These perceptions are further related to the use and the intention to use Internet banking.

For some unexplained reason, a consumer's reference group had a slightly negative influence on Internet banking usage. Security concerns were not found to have any impact on the adoption of Internet banking. This finding does not agree with the purportedly high concern by customers about security, which is published in several articles concerning Internet banking and e-commerce in general. Although security concerns may have influenced the decision of non-users to stay with the branch bank, the consumers who are familiar with the Internet in the first place have less security concerns. This finding is not typical in earlier literature and it may reflect the fact that the one-time pad security device which is in use in Finland's Internet payments may have had positive results both in the amount of mis-use (=very small) and the consumers' perception about the safety of Internet banking.

In our study and especially in the personal interviews, elderly people associate a bank transaction with human interaction. The prospect of typing on a keyboard to carry out a bank transaction seems a too detached and insecure method of banking to these people. This is one of the reasons of low Internet banking adoption rate among the senior citizens, who also seem to demand more social contacts than is possible with Internet banking. This points out the need for interactive web designs, or maybe new types of easy-to-use communicative terminals via newer digital channels.

Internet banking users indicated that convenience, speed and freedom of time and place were major reasons of their adoption the Internet banking in the first place. This sets high requirements to the functioning of the Internet server of the bank, which must be available always with high bandwidth to avoid delays, and with convenient user interfaces to minimize time consumed.   The current trend of advanced Internet banks toward the inclusion of other commercial activities on their banking sites may be detrimental to their customer relationships.

Future research

From a theoretical perspective, future studies will need to be conducted to increase the merit and credibility of these findings. The fact that the survey was carried out only in Finland might have an effect on the results. Thus, our adoption model is based entirely on Finnish consumer data. Future studies could, for example, expand this research abroad, and if successful, compare cultural differences in attitude and behavior.

Another area of future studies could be segmentation based on demographics and attitudes. In a recent paper, Machauer and Morgner (2001), for example, have used attitudes as segmentation criteria. This research could be renewed in couple of years time to see how the adoption of Internet banking and the factors affecting it have developed. To understand to real speed of Internet banking adoption, a follow-up study using time series would be in order.

From a social and ethical stand point, we would be also interested in doing some future research concerning the customer groups, who are getting bypassed by the technological developments. How could such customer groups be better taken into account when designing the future services, and prevent them from not getting overlooked.

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