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Customer Adoption of Internet Banking: An Empirical Investigation in Taiwanese Banking Context

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Abstract: In these days, banks work hard to attract consumers and keep their market share by providing them with more innovative services through Internet banking. Banking services are now just at the distance of one click from the mouse. The purpose of this paper is to explore how and why specific factors affect adoption of Internet banking in Taiwan context. The findings suggest six identified factors are significant in respect of customers' adoption of Internet banking services. Convenience, accessibility and feature availability are the main motivators for consumers to use Internet banking service. Results also reveal that security and privacy play important roles in discouraging the customers to use Internet banking services. Conclusions and managerial suggestions are proposed to provide a practical contribution for bank managers to better understand customers' perception of e-banking service quality and enhance customers' adoption rates.

Keywords: *Internet banking, banking services, customer adoption*

1. Introduction

In recent years, Internet banking has experienced amazing growth and has changed conventional banking practice. Internet banking users can access their accounts very easily through logging in to the bank's website with their personal identification numbers and passwords. Internet banking services include checking accounts balance, paying bills, transferring money between bank accounts, investing, trading foreign currency, etc. By providing Internet banking services, conventional financial institutions hope to lower operational costs, enhance banking service quality, and make customer relationship management more effective to further increase market share. Research proposed that an Internet-based consumer banking strategy might be effective, with reports of more profitable, loyal and committed consumers compared with traditional banking consumers (ABA, 2004; Fox, 2005). Therefore, current banks regard Internet channel as very important to conventional branches, ATM, telephone banking and call centers (Gartner, 2003a). Under the new banking circumstances, Internet banking is more and more used as an operational activity and an important component of a multi-channel strategy (Black *et al*., 2002). Although Internet banking gets popular and spreads very fast, some customers do not know it and others

who know it are unwilling to use it because of misapprehension such as password hacking, privacy, security, and so on. In order to enhance customer using Internet banking services, banks must understand the key factors that influence customer Internet banking adoption. The study examines the factors, which affect e-banking adoption in Taiwan, and finds the barriers of entry to better observe the level of acceptance of e banking in Taiwan. Besides, this research assesses whether the adoption of e-banking customers in Taiwan is constrained by demographic characteristics, such as different age groups, educational level, income level etc. Findings of the research are useful for the banking sectors in formulating appropriate strategies to satisfy their customer and increase Internet banking adoption rates.

2. Literature Review

The Internet Banking Market in Taiwan: Taiwan financial institutions are facing growing pressure to reduce operating costs and strengthen consumer's relationship since Taiwan's further financial deregulation. Besides, with Taiwan's entry into the World Trade Organization (WTO) in 2002, foreign banks enter Taiwan's domestic market and bring their advantages of capital and financial innovation. To cope with increasing competition and government financial liberalization, banks in Taiwan have gradually established new communication channel through Internet banking to improve customers satisfaction and provide faster, easier, and timely services. Internet banking in Taiwan was first offered by Fubon Bank in March 2000; afterward, other banks followed and provided their own Internet banking services. Until now, the most typical and the largest Internet banking in Taiwan is China Trust (http://www.chinatrust.com.tw/). According to a report published by the Ministry of Transportation and Communications (MTC Report, 2011), the population of Taiwan with Internet experiences exceeded 133 million in 2011. Besides, Internet banking services have been used widely in Taiwan, such as browsing their personal bank accounts, transferring money, inquiring financial goods through banks' websites, searching bank information, etc. However, not all service quality attributes have the same influence on customer perceptions (Yang, Jun, & Peterson, 2004); Taiwanese bank management is looking for methods to provide their consumers quality services in an effective and economic way (Yu, 2008).

Convenience: Many studies have been made to analyze the consumers' views on Internet banking services. As Poon (2008) stated with the proliferation of Internet and computer usage, the electronic delivery of e-banking service has become ideal for banks to meet consumers' expectations. Convenience has been identified as the most important factor for the consumers to adopt Internet banking services (Sakthivel, 2008; ACNielsen, 2005; Pew, 2003). E banking offers higher degree of convenience that enables consumers to access Internet bank at all times and places. Convenience was mostly described in terms of lifestyle, workplace use, housebound use as not having to travel, not having to wait, saving time and 24/7 access (Sharman & Kirsty, 2006; Pew, 2003).

Accessibility and Feature Availability: Apart from that, accessibility of computers was perceived as a

means of relative advantage (Suganthi *et al*., 2001). Gerrard and Cunningham (2003) also identified some service of paramount importance in ensuring the success of e banking, i.e. the ability of an innovation to meet consumers' needs using different feature available on the banking website. For example, providing fund transfer, foreign exchange rates, and mortgage calculators attracts customers to the bank's website.

Security: Consumer confidence in e banking would also mostly depend on how the banks would handle any wrong transactions and security concerns that may occur during Internet banking. One survey by Chung and Paynter (2002) identified consumer fears about transaction security as an inhibitor to adopt Internet banking service. All e-banking transactions occur on a secure server of a bank via the Internet. Consumers go to the bank's website, log in, and then use the bank's Internet services. Security plays a key role in Internet banking. Therefore, there are several protocols for Internet security of encrypted data packets (Dong-Her *et al*., 2004).

Privacy: Privacy concerns and protecting customers from fraud risk and financial loss were shown empirically to impact strongly on customers' attitude toward adopting online financial services (Montoya-Weiss *et al.*, 2003). Consumers doubt the trust ability of e-bank's privacy policies (Gerrard and Cunningham, 2003). Trust has significant effect on consumers' willingness to exchange money and personal confidential information online (Friedman *et al*., 2000; Wang *et al*., 2003).
Encryption technology is the most common feature at all bank websites to secure information privacy.

Speed: Hoffman and Novak (1999) found that there was a significant correlation between download speed and customers' perception of superior service quality. Speed of download mainly depends on the nature of the site-downloaded content, the computing hardware and method of connection used to download information (Jayawardhena and Foley, 2000). Very often, slow response time after any e-interaction results in delay of service delivery and makes customers unsure whether or not the transaction is completed(Jun and Cai, 2001). Johnston (1997) mentioned that certain actions, such as increasing the speed of processing information, were likely to have an important influence in terms of pleasing consumers.

Fees and Charges: Providing high quality services to satisfy customers' needs, at lower costs, is potential competitive advantage of Internet banking. Previous study indicated that Internet banking reduced successfully operating and administrative costs (Siriluck and Speece, 2003). Cost savings have helped Internet banks offer lower or no service fees, and offer higher interest rates on interest-bearing accounts than traditional banks (Gerlach, 2000; Jun and Cai, 2001).

Many researchers like Sara Naimi Baraghani (2008) in Iran and Georgia Marfo and Mensah (2009) in Ghana have studied the behavioral and technological reasons behind the resistance of adopting Internet banking. They concluded that limited information and communication infrastructure, lack of applicability,

cost factors, security concerns, and trust factors are barriers. Shamim and Kashif (2010) also pointed out security, privacy, slow response time, distrust factors, awareness and different banks infrastructure as hindrance in adopting e banking. However, we know that world has become global village, it is impossible to avoid using Internet banking. Besides, Internet banking mainly depends on the website that is a basic interface between customers and banks. Therefore, perceived risk, web content, features availability and service convenience determine customers' level of satisfaction (Godwin et, al. 2010).

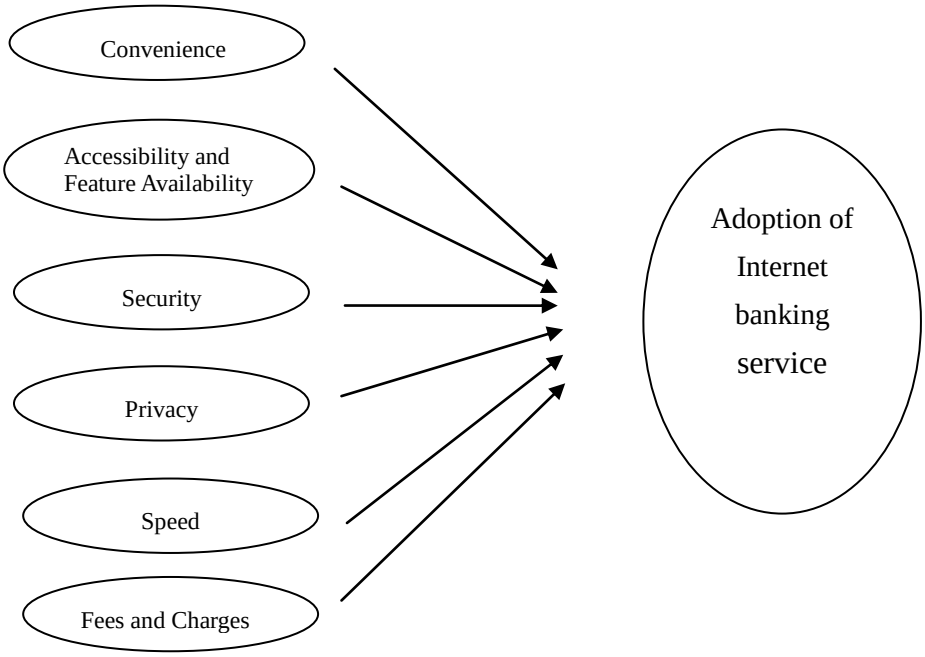
Research Objective: In this paper, we identify six different factors of banking website services from convenience, accessibility to fees and charges. Based on the survey of 281 respondents, the study attempts to explore consumers' perceptions and expectations on Internet banking and find out the factors, which motivate or discourage the consumers to adopt Internet banking services.

3. Methodology

Sampling and data collection: The review of empirical studies has contained different factors, which Internet banking service provides. However, the review of previous literature indicates past study most focused on the Western Internet banking subjects, little research was conducted by scholars for the Internet banking adoption in Asian customers. Taiwan is chosen as the location for this study because Taiwan is ranked ahead of Korea, Japan and Singapore from the perspective of the Internet penetration rate. Because the majority of Internet users in Taiwan are students and office, workers aged 18 to 50 with a higher education background and mostly reside in the north of Taiwan. They tend to spend more time and have more access to the Internet than other groups, and thus more likely to be Internet banking customers. Therefore, Northern Taiwan residents are selected to be the subjects in the study. To examine the factors affecting adoption of Internet banking service in Taiwan, a survey is conducted for this purpose. The survey instrument is a questionnaire based on the preceding literature and focuses on six factors, which are convenience, accessibility and features availability, security, privacy, speed, and fees. To ensure the content validity, almost all of the items on the questionnaire are selected and adapted from previous relevant studies. All items are measured on five-point Likert scales as self-reported attitudes. The scales go from strongly disagree (1) to strongly agree (5). 281 usable responses are acquired by means of the convenience sampling method. All data collection procedures are designed to ensure the anonymity. Demographic variables like age, gender, monthly income, education level are sought from the potential respondents to see if there are any significant differences between Internet and non-Internet banking users. The target respondents are those who had experience in using Internet banking services in Taiwan. To ensure that the questionnaire reaches the target, a screening question is asked. Only those answering affirmatively proceed to reply to the remaining questions. Non-users are asked to proceed to the personal data section to fill in demographic information.

Framework: this study proposes a framework, which is as follows:

Figure 1: Key factors in consumer adoption of Internet banking service



4. Results

Profile of the respondents: To investigate if there are any demographic variables influencing usage of Internet banking, the demographic profile of the respondents (both users and non-users) is presented in Table1. As for the users, the 21-30(30.16 per cent) and 31-40(55.55 per cent) age groups appear to have more access to the Internet and therefore use Internet banking for business-related purposes. This finding is consistent with the previous studies that the younger generation of lesser age is more computer literate and therefore is more likely to adopt Internet banking. In terms of respondents' education level, about 50.8 per cent of the total respondents indicate they obtain a bachelor's degree. They are followed by those with a master's degree or higher (39.68 per cent). We can know that customers with higher education level have been trained in Internet use through education and are more likely to adopt Internet banking service. When personal income is examined, 46.03 per cent of respondents have an annual income between NT$30,001 and NT$45,000 per month. They are followed by those earning NT$45,001-NT$60,000 per month (22.22 per cent) and then those making NT$60,001-NT$75,000 per month (14.29 per cent). The results show that people that are more affluent are more likely to possess computer and therefore adopt Internet banking. As for occupation of the respondents, the majority are financial workers (39.69 per cent). With information technology workers (34.92 per cent) and service workers (17.46 per cent), the occupational status shows most Internet banking customers are white-collar workers.

Table 1: Demographic profile of respondents

	Users		Non-users	
	Frequency	**%**	**Frequency**	**%**
Gender				
Female	84	66.67	110	70.97
Male	42	33.33	45	29.03
Age Group				
18-20	2	1.59	0	0.00
21-30	38	30.16	10	6.45
31-40	70	55.55	20	12.90
41-50	16	12.70	15	9.68
51-60	0	0.00	75	48.39
Above 60	0	0.00	35	22.58
Income Range				
less than NT$15,000	2	1.59	15	9.68
NT$15,001-NT$30,000	16	12.70	60	38.71
NT$30,001-NT$45,000	58	46.03	45	29.03
NT$45,001-NT$60,000	28	22.22	25	16.13
NT$60,001-NT$75,000	18	14.29	10	6.45
more than NT$75,001	4	3.17	0	0.00
Education				
Senior high school or less	0	0.00	45	29.03
College	12	9.52	65	41.94
Bachelor's degree	64	50.80	45	29.03
Master's degree or higher	50	39.68	0	0.00
Employment				
Information technology worker	44	34.92	20	12.90
Marketing and Advertising worker	4	3.17	15	9.68
Financial worker	50	39.69	30	19.36
Service worker	22	17.46	80	51.61
Teacher, Government worker	4	3.17	0	0.00
Student	2	1.59	0	0.00
Others	0	0.00	10	6.45

Non-users: As for the non-users, 70.79 per cent of the respondents are over 51 years of age. The older age group does not use Internet banking service maybe owing to little or no Internet experience. They also

have low level of awareness of current trends. Over 29.03 per cent of the non-users have high school or less qualification. In terms of income, 38.71 per cent of the respondents have an income of NT$15,001-NT$30,000.

Reliability test: Table2 depicts an overview of the mean scores and standard deviations of the six factors. A rule of thumb suggests that the acceptance Cronbach alpha (reliability coefficient) value should exceed 0.7(Hair *et al.*, 1998). Besides, the closer the reliability coefficient gets to the value of 1.0, the better the reliability of the measures is.

Factor analysis: Factor analysis is performed in order to examine and identify the basic dimensions of the constructs and its relationship with each other. The factor analysis results in six factors, which are appropriately named in line with the factors considered to affect the adoption of Internet banking service. Table2 shows the results of the factor analysis in terms of factor name, the variables loading on each factor and the variance explained by each factor. Overall, the six factors account for about 70.57% of the total variance.

Table 2: Factors affecting adoption of Internet banking

Items in Each Factor	Mean	Std dev.	Factor loadings	Cronbach's alpha	Percentage of variance
Convenience				0.826	13.36
I can access anytime and anywhere	3.97	0.671	0.61		
No queue	4.48	0.503	0.872		
Save time as compared to conventional banking	4.41	0.557	0.814		
E-banks transaction is easy to use	4.29	0.551	0.808		
I check my transaction details and statement regularly	3.97	0.74	0.512		
Accessibility and Feature Availability				0.846	12.95
Transfer fund between accounts	4.43	0.497	0.796		
Buy/Sell foreign currency	4.3	0.526	0.52		
Buy/Sell mutual funds	3.83	0.682	0.461		
Print account statement	4.14	0.641	0.565		
Pay bills	4.29	0.631	0.783		
Check account balance	4.57	0.497	0.724		
Security				0.871	12.87
The authorized username and password are important	4.51	0.59	0.84		
I don't leave my computer unattended,	4.41	0.661	0.72		

while connected to the e-banking services					
I am satisfied with the security system	3.11	0.598	0.772		
Banks' reliability in correcting erroneous transactions	3	0.693	0.577		
Trust the bank will compensate for losses due to security reasons	2.92	0.601	0.649		

Items in Each Factor	**Mean**	**Std dev.**	**Factor loadings**	**Cronbach's alpha**	**Percentage of variance**
Privacy				0.842	11.09
Confidential information is delivered safely from banks to customers	3.29	0.488	0.843		
Banking institutions keep customers information private and confidential	3.06	0.502	0.921		
I trust the bank's privacy protection to the users	3.08	0.515	0.854		
Speed				0.714	10.41
Easy to navigate the bank site due to smooth speed	4.05	0.376	0.709		
Response speed to complaint is satisfactory	3.21	0.649	0.853		
Speed of e-transactions flow is faster than traditional banking channels	4.16	0.571	0.497		
Fees and Charges				0.851	9.89
Prices of computer are reasonable and affordable	3.91	0.551	0.821		
Fee of Internet connection is affordable	4.11	0.442	0.824		
E-banks charge lower transaction fees	3.98	0.632	0.597		

Factor1 Convenience: One of the critical factors that affect the adoption of Internet banking is convenience. This factor obtains Cronbach's alpha score of 0.826. Users view e banking as convenient, in which access anytime and anywhere is perceived as an effective method to make transactions be done. Users strongly agree that no queue is advantageous with a mean of 4.48 and a standard deviation of 0.503. Users also agree that e banking is time saving as compared to conventional banking services with a mean of 4.41.

Factor2 Accessibility and Feature availability: The accessibility of computers affects usage of Internet banking. Besides, features availability is about services available on e banking. The factor has Cronbach's alpha score of 0.846 with a set of six items. Users agree that they can transfer fund between accounts and

transact foreign currency. However, according to survey responses, it appears that growing concern about further stock market losses has a significant influence on Taiwan customers' intention and actual use of online mutual funds buying. However, respondents agree that e banking allows them to print account statement and confirm the accuracy of all completed transactions with a mean of 4.14. This is especially important for users who often transfer fund or pay bills on line.

Factor3 Security: Security factor has Cronbach's alpha score of 0.871. Authorized username and password are extremely important with a mean of 4.51. The respondents also emphasize that they do not leave their computer unattended after logging in to the banking website. Meanwhile, most users do not believe that bank will make up for losses owing to security reason. Anyway, high frequency of correcting erroneous transactions would destroy reliability and be perceived as poor service ability.

Factor4 Privacy: Customers are usually aware of privacy issues, including whether the banks or third parties to market new products or services to them use their personal information. Privacy is an important factor influencing them to adopt Internet banking service. This factor has Cronbach's alpha score of 0.842. Respondents perceive that confidential information is not delivered safely from banks to customers with a mean of 3.29. Besides, passing consumers' financial information on to third parties should be forbidden without consumers' permission. Regarding this matter, respondents do not perceive that banking institutions do keep consumers' financial profile private and confidential. Therefore, there is stillroom for e banking to improve.

Factor5 Speed: Speed of e-transactions flow is critical for the users to perform e-banking transactions. This factor obtains Cronbach's alpha score of 0.714. With a mean of 3.21, response speed to complaint is not satisfactory to the respondents. Therefore, it is recommended that banks in Taiwan should respond in a timely manner to customer inquiries and complaints. Besides, the Taiwan government should commit itself to improving network infrastructure to provide the Taiwan people with affordable and reliable high-speed Internet access.

Factor6 Fees and charges: One of the features that determine customers' using e-banking service is fees and charges. This factor has Cronbach's alpha score of 0.851. Most respondents perceive that prices of computers and fee of Internet connection are reasonable and affordable. Besides, users also agree lower transaction fees charged by e-banks.

5. Conclusion

In view of competition in the growing market, it is important for banks to get a critical market share. It is therefore important to understand the current adoption of Internet banking in Taiwan and to identify the demographic profile of adopters. Marketing plans are more effective when the inhibitors and adopters are

understood. This research has attempted to provide such an insight. With 45% of the sample population adopting Internet banking, the research concludes the Internet banking market in Taiwan is not yet saturated. The fact is supported by Wan et al., (2011) who also found that the market was developing but that there were still considerable development opportunities. Of those who adopt Internet banking, the major services used are account transfer, bill settlement, account balance inquiry and interest rate/exchange rate quote inquiry. The main reasons for bank customers adopting Internet banking are seen to be the ability to perform banking transactions anywhere, anytime and quickly. These findings are consistent with other research findings (Hackett & Parmanto, 2009). Therefore, we can confirm that convenience, accessibility and feature availability have significant influence on customer satisfaction. Security and privacy are still two major influencing factors for customers in evaluating Internet banking services (Liao & Cheung, 2008). Security includes protecting consumers from fraud risk and financial loss when they conduct financial transactions. Trust also has striking influence on customers' willingness to engage in online exchanges of money and personal confidential information (Wang et al, 2003). Besides, privacy protection is important dimension that may affect customers' intention to adopt e-based transaction systems (Ahmad & Zubi, 2011). In this respect, banks need to exploit service quality, credibility, and confidence as competitive tools.

Banks in Taiwan have used numerous measures to raise customers' confidence, such as advanced encryption technology, firewall, anti-virus program, requiring users to provide unique identifiers, logging users off the account automatically after a few minutes of inactivity and secure electronic billing presentment and payment system. Although security and privacy issues are noted as a concern, particularly with regard to hacking of personal financial details, our finding shows customers place convenience of Internet banking ahead of security and privacy concerns. This finding was also previously reported in ACNielsen (2011) survey. Internet banking adopters in Taiwan have learned to tolerate and understand security, privacy and trust issues by implementing personal risk management strategies such as printing electronic documents as proof in the loss event. Transaction speed has received attention in e banking owing to an increase in focus on the efficiency of operational resources. Therefore, it is frequently discussed as an important factor of customer satisfaction in commercial website evaluations. Liao and Cheung (2008) argued that in advanced societies, consumers tend to be highly sensitive to the speed of service delivery. Thus transaction speed, as a timesaving feature-is expected to have a positive influence on customer satisfaction with Internet banking. At a time when many financial institutions invest heavily in the Internet as a medium for financial services, the result shows convenience, accessibility and feature availability are more important factors of the banking website. Consumers' care about online banking security and privacy is closely connected with their viewpoint of how good the technologies for internet banking transactions are. Therefore, it is important for internet banking provider to take advanced encryption technology to protect customers' privacy, information and security. Besides, speed, fees and charges are also realized to influence customer satisfaction. So future internet banking penetration and the success of complicated financial product offering will need to intensify online marketing activities

connected with increasing website security, speed and charges factors. In short, successful internet banking service mostly relies on improving features available and increasing website security, privacy and speed to help customers' decision-making processes more convenient. Therefore, banks may need to focus on the core functions of internet banking services and design these utilitarian features as effectively as possible.

Suggestion: Banks providing online services in Taiwan face many challenges. First, Internet banking is acquiring popularity among consumers in Taiwan. Most adopters are young population. However, almost all the banks provided online services at about the same time. The competition between banks becomes fiercer. Recently, most Internet banking websites provide a variety of information areas such as investment, real estate, and personal financial planning. These additional information services can provide a way to gain competitive advantage in e banking. E-banking managers must keep a close eye on information content to satisfy their customers. Second, the findings will also help banks to understand the profile of non-users. Non-users perceive that their current banking method is convenient, lack awareness of e-banking relative advantages, worry security issues and distrust Internet banking channel. Aiming at these non-users, banks must create the circumstances of reliability and get rid of any anxiety about security concerns. Arranging free training courses continuously, establishing confidence in security-related issues and having knowledgeable staff readily available at branches or contact centers may induce prospective users to switch some of their banking activities to online mode. Third, compared with conventional Internet access method using telephone or cable networks, the new Internet access method by means of wireless mobile devices—for instance, cell phone, PDA and mobile computer—allows financial services to be extended to the circumstances without the telephone line or cable, providing great business opportunities for financial institutions. Therefore, it is worthy of studying how mobile devices and wireless Web technologies affect Taiwan customers' perception of using Internet financial services and what theoretical factors significantly influence Taiwan customers' intention to use wireless financial services. The empirical analysis also shows that in the global competition world, to promote Internet banking service it is very critical that the banks must ensure consumer service quality. "Quality in Internet banking" and "satisfaction of consumers" is the two key points, which must be paid close attention to promote Internet banking service.

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