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An Empirical Study of Factors Influencing the Adoption of Internet Banking

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An Empirical Study of Factors Influencing the Adoption of Internet Banking

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ABSTRACT

With rapid development of information technology, the banking industry has undergone significant operation changes over the last decade. Owing to few studies have examined the role of privacy concerns, trust and their antecedents in this issue, we consider that it is essential to identify the factors affect the adoption of Internet banking. Therefore, an empirical study was undertaken and the data of 670 responses was collected. In our attempt to bridge this gap, we found that perceived vulnerability and social awareness can significantly affect privacy concerns. In addition, perceived reputation and perceived similarity are also significant antecedents of trust, and it is consistent as prior studies in other fields. Furthermore, we found no support for the hypothesized effect of perceived size on trust as physical e-commerce. Finally, to our surprise, the negative relationship between privacy concerns and behavioral intention does not support.

Therefore, bank managers can take these hypotheses into strategic considerations when they popularize the internet banking services to their customers. Since social awareness and perceived vulnerability are the personalities of the customer, banks can enhance their trust by not only reinforcing the physical reputation but also building up more similarity between physical bank and website style of internet banking. In sum, our research provide a different perspective on this critical, and we can reconsider other related factors in the further research.

Keywords

Internet banking, perceived similarity, privacy concerns

INTRODUCTION

The banking industry has undergone significant operation changes over the last decade, thanks to advances in information technology. With the development of the internet, the banks provide more diversified, convenient and flexible services than before. Prior researches explored the intention to use internet banking based on TAM(Technology Acceptance Model) theory(Cheng et al. 2006) or DOI(Diffusion of Innovations) theory (Tan et al. 2000). TAM theory focus on the perceived usefulness and perceived ease of use, and DOI discussed about relative advantage, technical compatibility and complexity. However, since people are proficient in the computer and internet, the barriers of technical competence is reduced than before. It is curious for us why the customer who is making an online shopping to be reluctant to adopt Internet banking on the web(Eriksson et al. 2007). Compared to the traditional model of physical banks, customers can't walk into the store and usually touch, feel, and even consult the services face-to-face if they adopt internet banking. Therefore, the more risk and uncertainty the customer sense, the less will they will adopt virtual banking services. Apparently, it is critical to discuss the issue of adoption of Internet banking. In this study, we endeavor to disclose the factors that make affect individuals' intention to adopt Internet banking.

LITERATURE REVIEW

Privacy Concerns

For many online consumers, loss of privacy is a main concern, and the protection of transaction information is crucial (Kim et al. 2007). Hence, we conceptualize privacy concerns as the degree to which an Internet user is concerned about online marketers' collection of personal information, the user's control over the collected information, and the user's awareness of how the collected information is used (Malhotra et al. 2004).

(Dinev et al. 2006) also defined privacy concerns as concerns about possible loss of privacy as result of a voluntary or surreptitious information disclosure. Customer self-service oriented systems should make sure that their consumers can easily check the status of their information is used (Hwang et al. 2007).

Social Awareness

Social awareness is about appreciating the needs, impetus, and historical specificity of social events and processes (Dinev et al. 2006). Previous study has linked social awareness to individuals' attitudes and cognitive development. (Dinev et al. 2006) defined social awareness as citizens' behavior with respect to following and being interested in and knowledgeable about community and government policies and initiatives.

Perceived Vulnerability

The conception of vulnerability emerges from the complex definition of privacy (Tamara et al. 2004), and it describes as the perceived potential risk when private information is exposed and has been considered in the literature as a factor which determines the perceived state of privacy and individual experiences.

The unpredictability of the Internet infrastructure increases consumers' fears that hackers or the third party will threaten their financial secrets or disclose personal information (Pavlou 2003). (Tamara et al. 2004) defined perceived vulnerability as the perceived risk when personal information is revealed.

A consumer's perceived vulnerability has been found to influence his or her online decision (Antony et al. 2006; Kim et al. 2007). Perceived vulnerability may also cause customers to reject new technology-based service delivery (Rotchanakitumnuai et al. 2003).

Trust

Trust is the central dimension of e-commerce systems adoption, which is one of the most important aspects of e-commerce customer relationship management (Hwang et al. 2007). The importance of trust is elevated in the highly uncertain e-commerce environment (Pavlou 2003). Trust is related to form performance, satisfaction, competitive advantage, and other economic outcomes such as transaction cost (Balasubramanian et al. 2003) and search cost reduction (Gulati 1995). In addition, (Kim et al. 2000) proposed that propensity to trust, word-of-mouth referral, and institutional characteristics were the antecedents of initial trust. Nevertheless, these factors are not critical as before.

(Gefen 2002) provided a multi-dimensional concept combining specific constructs of trust: integrity, benevolence, and reliability. Moreover, (Kuan et al. 2007) found that offline trust is positively related to online trust, and (Katherine 1999; Katherine 2003) proposed that trust in a website is affected by trust in a physical store. In conclusion, trust becomes the essential strategy for dealing with an uncertain and uncontrollable future (Kim et al. 2007).

Perceived Reputation

Research have recognized that a firm's reputation is a valuable intangible asset that requires a long-term investment of resources, effort, and attention to customer relationships (Teo et al. 2007). Therefore, most of all, a vendor with good reputation is perceived to be unwilling to jeopardize their reputation by acting opportunistically (Chiles et al. 1996).

In addition, (Teo et al. 2007) indicated that reputation is vulnerable because it is harder to form a reputation than to lose it.

Perceived Size

Reputation and size have been most frequently suggested as factors that contribute to consumer trust in a seller organization (Jarvenpaa et al. 1999). Larger organizational size also indicates that the firm is likely to possess expertise and necessary support systems that encourage trust and loyalty (Teo et al. 2007). (Koufaris et al. 2004) defined perceived size as how large customers perceive a company to be. Large size may indicate to customers that the company is better able and more willing to compensate them in the case of product failure (Koufaris et al. 2004). (Teo et al. 2007) indicated that a large overall size and market share suggests that the firm consistently delivers on its promises to its consumers and many consumers tend to trust it.

Perceived Similarity

(Katherine 2003) examined trust transfer as a means of establishing trust in organizations doing business on the WWW. She also defined perceived similarity as perceivers form an impression and as more information is gathered they could confirm

the former impression. Considering trust transfer as a cognitive process, transfer occurs when a person (the trustor) bases initial trust in an entity on trust in some other related entity (Katherine 2003).

(Katherine 1999) proposed that transfer occurs based on perceived associations. That is, the potential trustor sees that the unknown target is associated with a known individual, firm, or neighborhood, and bases trust in the target in that known entity.

RESEARCH METHODOLOGY

Research Model

Based on literature review, we build a research model and depict it in Figure 1. In the conceptual model, we illustrate the possible factors that might impact on the intention to adopt internet banking.

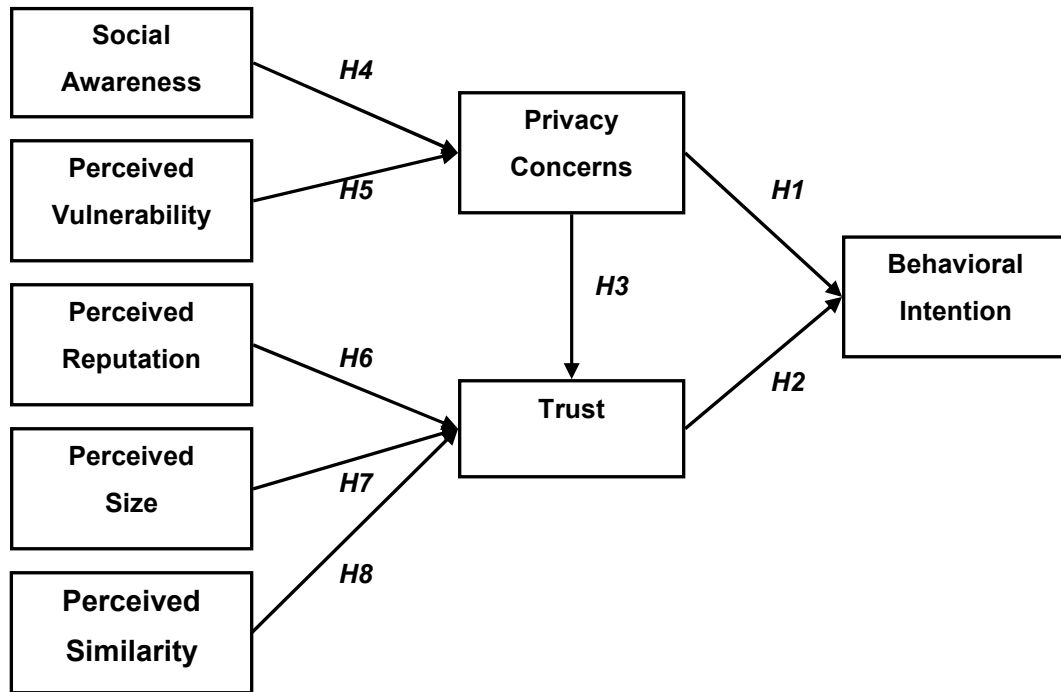


Figure 1. Research Model

Hypotheses

According to previous discussions and research model, this study proposed the following seven hypotheses:

Trust is defined as the degree to which people believe a firm is dependable in protecting consumers’ personal information ((Gefen et al. 2003). There is a negative relationship between level of trust exhibited toward a direct marketer and potential risk for loss of privacy and security of personal information (Eastlick et al. 2006). In addition, researchers have found that on-line purchasing intent is most impacted by security and privacy concerns (Tamara et al. 2004).

Regarding Internet banking, it is expected that the relationship between privacy concerns and trust in Internet banking will be similar to that observed for other E-commerce (Eastlick et al. 2006). The use of technology-enabled services implies confidence and trust that the services delivery system will perform satisfactorily, accurately and reliably, and deliver the services required (Walker et al. 2006). (McKnight et al. 2002) found that trust is a multidimensional construct and that trusting beliefs are related to trusting intentions. Based on the considerations outlines above, we propose that:

Hypothesis 1: A higher level of privacy concerns (Privacy) leads to the lower level of behavioral intention (Intention).

Hypothesis 2: Trust will be positively related to the behavioral intention (Intention).

Hypothesis 3: A higher level of privacy concerns (Privacy) leads to the lower level of trust (Trust).

People with high social awareness will tend to speak up against social injustice, create awareness of how people affect the environment, and perceive high privacy concerns. (Dinev et al. 2006) proposed that the greater one's social awareness, the more importance one will place on privacy as a societal value.

Perceived vulnerability may be grounded in concerns with regard for the technical performance or functional reliability of the service delivery system, and associated with concerns about personal privacy and security (Walker et al. 2006). The higher the risk evaluation, the less trust consumers may have (Wang et al. 2007). Perception of the outcome of information disclosure determines privacy concerns. Thus, we propose the following hypotheses:

Hypothesis 4: A higher level of social awareness leads to the higher level of privacy concerns (Privacy).

Hypothesis 5: A higher level of perceived vulnerability (Vulnerability) leads to the higher level of privacy concerns (Privacy).

(Eastlick et al. 2006) indicated that firm reputation is a common factor leading customers to trust with firm's integrity, benevolence, and ability. Generally, customers keep the banks' reputation in their mind and use these criteria to evaluate which bank they will choose if they want to use Internet banking services.

In the traditional marketing literature, reputation has been shown to be positively related to the buyer's trust in the seller. Furthermore, in Internet banking, perceived reputation of a bank has also been revealed to consumers' trust in the Internet banking. Therefore, we postulate that:

Hypothesis 6: A higher level of reputation (REPUTATION) leads to the higher level of trust (TRUST).

In an e-commerce environment, large size suggests that the vendor is able to assume the risk of product failure or transit losses and to compensate buyers accordingly (Teo et al. 2007). Customers often assume that a large company has the capabilities necessary to provide them with the services and support they desire, thereby increasing their trust in the company (Koufaris et al. 2004).

Moreover, (Teltzrow et al. 2007) found that the consumer perception of a retailer's physical store presence may also have a positive influence on the perception of consumer trust in the same merchant's e-store. Thus, we propose that:

Hypothesis 7: A higher level of perceived size (Size) leads to the higher level of trust (TRUST).

(Katherine 2003) proposed that the greater the perceived similarity between an unknown target and a trusted target, the more positive the initial trusting beliefs about the unknown target will be. In our study, most Internet banking providers have their physical banks, and the customers will evaluate whether adopt the Internet banking base on their perceived similarity between the Internet banking and the physical banks. Perceived similarity means the transaction process, service style, and consultative services. Furthermore, the more perceived similarity between physical bank and operating Internet banking, the more trust customers have (Katherine 1999; Katherine 2003).

Therefore, we postulate that :

Hypothesis 8: A higher level of perceived similarity (Similarity) leads to the higher level of trust (Trust).

Instrument Development

The measurements of variables are adapted from prior studies and modified slightly to meet the specialized explanations in our study. All items are measured with 7 point Likert-type scales from "strongly agree" (7) to "strongly disagree" (1).

Prior to the survey, pretest and pilot test were conducted after the questionnaire was designed. Two academia experts and two students who have used Internet banking were invited to participate in our pretest. In addition, 37 respondents took part in the study. As a result, they are suitable to be the samples of pilot study.

To determine the internal consistency for each construct, the Cronbach's alpha values were calculated. The result in Table 1 proved each construct has notable reliability because the Cronbach's α coefficients of all constructs above the limit of 0.7.

Construct	Number of Scale Items	Cronbach's α
Social Awareness	6	0.808
Perceived Vulnerability	8	0.905
Perceived Reputation	5	0.871
Perceived Size	3	0.752
Perceived Similarity	4	0.880
Privacy Concerns	4	0.961
Trust	4	0.925
Behavioral Intention	4	0.909

Table 1. Cronbach's α of Each Construct

Sampling and descriptive statistics

The survey was administered to the users who can access the banking services via the Internet. Beside posted the questionnaire on the some forums of banking services for a period of time, and hoped for attracting more eligible user to participate in our survey. We also offered a lucky draw with prizes up to \$ 500 to attract more respondents. The total valid responses were 670.

The proportion of male (62.8%) is a little more than female (37.2%). Age range from less than 20 to 31 or above, however, most of respondents fall in "20-39" (86.9%). The majority (31.39%) use Internet banking to view their account balances and transaction histories.

Measurement Validation

This section will discuss the process and the result of analysis. To avoid problems in SEM analysis, one must check the data for normality and multicollinearity (Kline 2005). First, the normality and multicollinearity will be examined with SPSS. Then hypotheses and the model of this study will be examined with AMOS.

After checking the data for normality and multicollinearity, a two-stage methodology of SEM was carried on. In the result values of model fit indexes with all measurement items, only one index value was lower than the criteria recommended. After dropping 7 items, the CFA showed acceptable model fit in Table 2. The ratio of χ^2 to d.f was also under the recommended value.

Internal consistency is evaluated by the composite reliability and the AVE of constructs. The values of composite reliability and average variance extracted provided in Table 2 were almost higher than the criteria (Cooper et al. 2006), and therefore indicative of good internal consistency.

Convergent validity was evaluated by the values of standard factor loadings of items with the criteria suggested. Standard factor loadings of all items apparently were higher than 0.6, and had a good convergent validity as shown in Table 2. The correlation matrix of variables was checked. We can see that all the values are lower than 0.85 from Table 3. This indicates that no remarkable correlations in pairs.

Latent Variable	Observed Variable	Standard Factor Loading	Measure Error	Composite Reliability	Average Extracted Variance
perceived Reputation	R2	0.809	0.345519	0.93	0.83
	R3	0.959	0.080319		
	R4	0.951	0.095599		
Perceived Similarity	Sim1	0.746	0.443484	0.88	0.65
	Sim2	0.796	0.366384		
	Sim3	0.795	0.367975		
	Sim4	0.891	0.206119		
Perceived Size	S2	0.747	0.441991	0.85	0.74
	S3	0.939	0.118279		
Perceived Vulnerability	V1	0.833	0.306111	0.93	0.72
	V2	0.911	0.170079		
	V3	0.929	0.136959		
	V4	0.651	0.576199		
	V5	0.901	0.188199		
Social Awareness	SA1	0.613	0.624231	0.80	0.44
	SA2	0.618	0.618076		
	SA3	0.738	0.455356		
	SA4	0.710	0.4959		
	SA5	0.615	0.621775		
Privacy Concerns	PC1	0.908	0.175536	0.96	0.86
	PC2	0.942	0.112636		
	PC3	0.941	0.114519		
	PC4	0.918	0.157276		
Trust	T1	0.885	0.216775	0.92	0.74
	T2	0.925	0.144375		
	T3	0.792	0.372736		
	T4	0.904	0.182784		
Behavioral Intention	I1	0.785	0.383775	0.91	0.71
	I2	0.749	0.438999		
	I3	0.928	0.138816		
	I4	0.920	0.1536		

Table 2. The Results of Reliability and Validity with CFA

	Rep	Simi	Size	Vul	SA	PC	Trust	Int
Rep	1.000							
Simi	0.533	1.000						
Size	0.365	0.334	1.000					
Vul	-0.063	-0.056	0.112	1.000				
SA	0.193	0.132	0.217	0.134	1.000			
PC	-0.056	-0.034	0.121	0.534	0.142	1.000		
Trust	0.554	0.505	0.215	-0.194	0.216	-0.206	1.000	
Int	0.455	0.369	0.186	-0.062	0.262	-0.097	0.598	1.000

Table 3. Correlation Matrix of Constructs

Finally, the discriminant validity of model constructs was evaluated with the test suggested by (Fornell et al. 1981). Comparing the values in Table 4, we obtained a good discriminant validity of each construct. In sum, the measures have good convergent reliability and discriminant validity.

	Rep	Simi	Size	Vul	SA	PC	Trust	Int
Rep	0.61							
Simi	0.28	0.65						
Size	0.13	0.11	0.58					
Vul	0.00	0.00	0.01	0.56				
SA	0.04	0.02	0.05	0.02	0.42			
PC	0.00	0.00	0.01	0.29	0.02	0.86		
Trust	0.31	0.26	0.05	0.04	0.05	0.04	0.74	
Int	0.21	0.14	0.03	0.00	0.07	0.01	0.36	0.71

Table 4. The Results of Discriminant Validity Test

Hypotheses Testing

The GFI of fit indexes is 0.860. Respectively, CFI and IFI are 0.929 and 0.930, NNFI is 0.923 and RMSEA is 0.064. Despite the value of GFI equal to 0.860, lower than the recommended threshold, but in practice, GFI values above 0.8 is still considered an acceptable value and indicating a good fit (Gefen et al. 2000). Therefore, the overall model still indicated an acceptable fit to the data.

Figure 2 shows the standardized LISREL path coefficient and the significant level of each path in the model. All the paths were significant except two paths: the path between perceived size and trust ($\gamma=0.02$, $t\text{-value}=0.523$), and the path between privacy concerns and behavioral intention ($\gamma=0.04$, $t\text{-value}=1.200$). At last, the explained degrees of variance were privacy concerns ($R^2=0.30$), trust ($R^2=0.37$), and behavioral intention ($R^2=0.37$).

Most hypotheses were supported by the data analysis results with SEM technique except H3, H4, and H7.

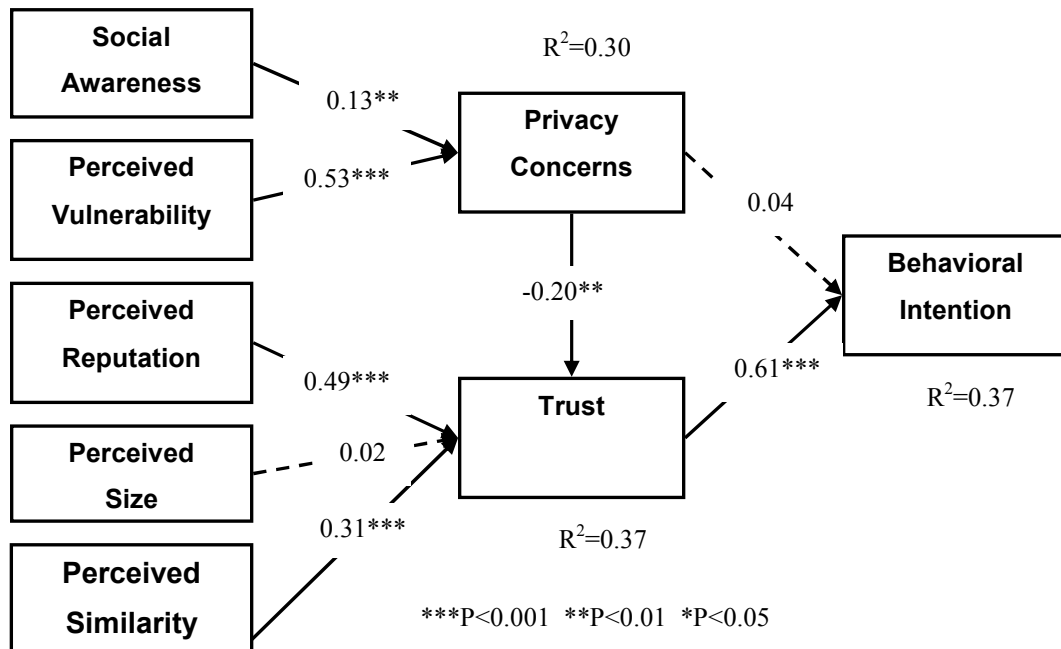


Figure 2. Standardized Path Coefficient and significance Level

CONCLUSIONS AND SUGGESTIONS

This study focused on privacy concerns, trust and their antecedents and contributed to theory by demonstrating that these perceptions play a causal role in the adoption of Internet banking. The hypotheses proposed were almost supported except H1, and H7. According to the results of this study, the conclusions have been drawn and described as follows.

As shown in Figure 2, almost each hypothesis was statistically significant at level 0.01. To our surprise, the relationship between privacy concerns and behavioral intention did not support H1 and against previous findings (Dinev et al. 2006; Eastlick et al. 2006; Malhotra et al. 2004; Paine et al. 2007). There are two explanations to elucidate why hypothesis 1 is not significant.

First, over ninety percent (91.04%) of the respondents have used the Internet more than 5 years, and over fifty percent (57.16%) of the respondents spend more than 4 hours on the Internet per day. It implies that most respondents are heavy Internet users. The reason might be that these users in Taiwan are accustomed to the risk in Internet environment so that they understand what risk they encounter. On the other hand, even though there are high privacy concerns, they still intend to trust Internet banking and to use it. In addition, it might be the other reason that relative advantages play an essential role on the behavioral intention. (Tornatzky et al. 1982) found relative advantage to be an important factor in determining adoption of innovations. Furthermore, Internet banking services allow customers to access their banking accounts from any location, at any time of the day, it provides tremendous advantage and convenience to users (Tan et al. 2000). (Eastin 2002) proposed that convenience and economic advantage are important components in e-commerce activities. Therefore, it can be the reason why customers intend to use Internet banking even if there are high privacy concerns.

Next, we discuss the relationship between perceived size and trust, and this hypothesis has not been confirmed in our study. One possible explanation for the lack of support for the positive relationship between perceived size and consumer trust could be that the perceived size of Internet banking does not influence consumers' trust as the perceived size of a traditional business does (Teo et al. 2007). In the physical world, it is easy for customers to assess a bank's size themselves through its physical presence. However, our study is to examine that whether offline physical bank's size affects the customers' trust. One reason might be that additional constructs such as familiarity have an influence on the intention to use Internet banking (Teltzrow et al. 2007). Customers' familiarity could be built up if they were accustomed to use the physical bank. Most customers will adopt the new Internet banking services base on their previous experiences. As a result, the relationship between perceived size and trust is not significant. Furthermore, as we can see in Table 5, the relationship between perceived

size and trust was only supported in investing service. We found that there is no significant difference between different services. To sum up, this study proposed perceived vulnerability and social awareness on privacy concerns, and emphasized the role of perceived reputation and perceived similarity on trust. It provided empirical evidence of how these factors influence the adoption of Internet banking.

Service	N	Path Perceived Size -> Trust	Path Privacy Concerns -> Behavioral Intention
Investing	157	0.23*	0.01 ^{ns}
Viewing account balances and transaction histories	209	-0.11 ^{ns}	0.01 ^{ns}
Funds transfer	275	0.02 ^{ns}	0.08 ^{ns}

Note. * indicates a significant t-value on 5%-level. ns= not significant.

Table 5. Overview of Relevant Path Coefficients for Different Services

Limitations

Although the empirical results are largely supported by the proposed models, there are several limitations concerning this research. Along with the findings above, we would like to propose some limitations of this study.

First, one of the limitations of this study is the generalization of the sample. Because there are many Internet Banking services provided on the internet, our sample may be not as the same as the true population. In addition, through online survey, the response rate of survey is difficult to calculate. Second, all the questionnaire items were translated from prior foreign studies, so the questionnaires might not be suitable for the respondents in Taiwan.

Finally, the online questionnaire was used in our research. To keep off the redundant respondents, we checked the IP address, E-mail address, the consistence of the reverse items. However, we still cannot solve the questionable respondents completely if they modified their IP address or response our questionnaire on another computers. Therefore, what discussed above may be limitations of the study.

Implications: Theoretical and Practical

Previous studies of Internet banking most merely focus on the acceptance of technology and diffusion of innovation. Based on the prior literature on marketing, EC fields, we proposed the different factors to discuss. In addition, trust transfer between physical and internet banking had examined that is was significant in our research. We can understand the first impression in internet banking plays an important role on customers' initial trust. Besides, we have examined many other factors because Internet banking is complex for the customer. Thus, the findings of this study will provide the different theoretical view of adoption of Internet banking. Furthermore, future study may discuss the factors influencing the adoption intention since social awareness, perceived vulnerability, perceived reputation, and perceived similarity have been confirmed. However, the relationship between privacy concerns and behavioral intention was not supported in our study and this was an important finding. Not only because it was not consistent with our hypothesis but also why privacy concerns was major factors in most research. Moreover, the pure virtual banking is developed in recently years, in contract to the brick and mortar banking

For practical perspective, although most banks have provided the Internet banking services, the adoption rate is still lower than they expect. In this study, if the bank with reputation, the manager can consider how to improve perceived similarity between Internet and physical bank, and lower the perceived vulnerability, privacy concerns to enhance the trust of the customers. Because the relationship between privacy concerns and behavioral intention was not supported in our study, it implied that even if the customers concern about the privacy, they still choose to adopt internet banking. Therefore, providing a secure transaction environment is basic requirement to the customers. In addition, perceived similarity is important for the

customers to build initial trust. The design of the website should be considered whether the customers will feel more similarity with the physical bank what they had experienced.

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