

## An Extension of Financial Cost, Information Quality and IDT for Exploring Consumer Behavioral Intentions to Use the Internet Banking

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### *Abstract*

*Due to the continuous improvement of Internet technology, the number of Internet users in the whole world has been increasing rapidly. It was estimated that there were 1.2 billion Internet users in 2013, thus making Internet banking a popular activity, too. In this study, the Diffusion of Innovations Theory proposed by Rogers (1983) and Technology Acceptance Model (TAM) will be used as a framework, based on which three variables, namely financial costs, information quality and computer self-efficacy, will be added in. Hopefully, in this way, this paper can design a new and better hybrid of Technology Acceptance Model to study the impact on the behavioral intention of Internet banking users in Taiwan. The results of the study show compatibility, perceived usefulness, perceived ease of use, computer self-efficacy, information quality has a great positive effect upon the behavioral intention to use the internet banking; and perceived financial cost has a great negative effect upon the behavioral intention.*

**Key Words:** *Internet Banking, financial costs, Diffusion of Innovation Theory, Computer Self-Efficacy, Information quality.*

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### **Introduction**

With the arrival of global competition, the era of the knowledge-driven economy and development of the internet, surging changes in technology innovation, both internally and externally, the media- internet network in the 21st century, have characteristics and advantages that surmount the space and distance limits. It is not only facilitating e-commerce to grow vigorously but also changing the enterprise business model fast.

Since the people of the world who resort to internet have been increasing quickly, the total population who exploits internet has reached from 70 million of people by the end of 1997 to 1.2 billion by 2013. Besides, the population that exploits financial network service has also been increasing. Under the impact of Internet, it is a trend of inevitability that banks would make use of internet to provide financial service. Internet banking has recently come to be considered as one of the most effective banking transaction methods because it possesses many advantages which offline banking channels can not offer (Huang *et al.*, 2005).

This study has integrated technology acceptance model (TAM) put forth by Davis *et al.*, (1989) as well as diffusion of innovation theory (IDT) by Rogers (1995), while two other research variables as trust and perceived financial cost are added to design a newly-blended technology acceptance model to research the factors that would affect user behavioral intention of internet banking in Taiwan. The research proposes two new constructs trust and perceived financial cost, to enhance the understanding of the internet banking. Finally, this research explains users' behavioral intentions from a user's perspective, the findings of this research help to develop more user friendly technology and also provide insight into the best way to promote internet banking. By explaining users' intentions from a user's perspective, the findings of this research not only help to develop a more user-acceptable internet banking, but also provide insight into the best way to promote internet banking to potential users.

## Literature Review

### Perceived Financial Cost

Perceived financial cost is defined as the extent to which a person believes that using the internet banking will cost money. Indeed, economic motivations and outcomes are most often the focus of IS acceptance studies. Luarn and Lin (2005) found that perceived financial cost had a negative effect on the behavioral intention to use mobile banking.

### Innovation Diffusion Theory

Diffusion has been defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system", and an innovation is "an idea, a practice, or an object that is perceived as new by an individual or another unit of adoption". In other words, the course of communicating innovative information can be called "innovation diffusion" which mainly describes a certain special dynamic course, hence one can understand the change of states in due course of an individual or an organization adopting innovations. Innovation diffusion theory (IDT) is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system". It has been widely applied in disciplines such as anthropology, sociology, education, communication, marketing, etc (Rogers 1995).

IDT includes five significant innovation characteristics: relative advantage, compatibility, complexity, trial ability and observability. Relative advantage means that innovations can bring greater advantage than traditional methods. Compatibility means consistency among innovations and existing value, past experience, requirements of purchasing managers and procurement. Complexity represents the level of difficulty in understanding innovations and their ease of use. Trial ability refers to the degree to which innovations can be tested. Observability refers to the degree to which the results of innovations can be observed by people. These characteristics are used to explain the user adoption and decision making process. However, previous studies found that only relative advantage, compatibility, and complexity are consistently related to the adoption of innovation.

### Technology Acceptance Model

TAM, adapted from the theory of reasoned action (TRA), appears to be the most widely accepted among information systems researchers (Davis *et al.*, 1989). TAM originally suggested that two beliefs- perceived usefulness and perceived ease of use - are instrumental in explaining the variance in users' intentions. Perceived usefulness is the degree to which a person believes that using a particular system enhances his or her job performance. Perceived ease of use is the degree to which a person believes that using a particular system will be free of effort. These determinants are also easy to understand for system developers and can be specifically considered during system requirement analysis and other system development stages. These factors are common in technology-usage settings and can be applied widely to solve the acceptance problem (Tung and Chang, 2007).

Information systems researchers have investigated TAM, and agreed that it is valid in predicting the individual acceptance of various corporate IT systems (Ramamurthy *et al.*, 2008). Information system researchers have discovered that PU has a positive effect on the behavioral intention to use IT systems (Chen *et al.*, 2002). Information system researchers have found that PEOU has a positive effect on the behavioral intention and PU to use IT systems (Gefen *et al.*, 2003). Venkatesh and Davis (2000) propose an extension, TAM2, which includes social influence processes (subjective norm, voluntarism, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and PEOU). In addition, prior studies have extended TAM with constructs such as cognitive absorption and product involvement and perceived enjoyment (Koufaris, 2002).

### IDT and TAM Relationship

IDT includes five significant innovation characteristics: relative advantage, compatibility, complexity, trial ability, observables. In fact there's a little similarity between IDT and TAM, and each is complementary to the other. Previous studies have found that the relative advantage construct in IDT is similar to the perceived usefulness in TAM, and the complexity construct in IDT is similar to the perceived ease of use.

But in TAM research, compatibility has not been studied. In order to increase the credibility and effectiveness of the study, in this research, we improve TAM and include the compatibility study as an additional research construct to carry on this research. Because compatibility means the consistency between innovations and existing value, past experience, requirements of purchasing managers and procurement, great compatibility results in a fast rate of adoption. Since previous research has shown no apparent correlations between trial ability, observability and IT adoption, we exclude these research constructs (Wu and Wang, 2005). Wu and Wang (2005) integrated IDT into TAM to investigate what determines user mobile commerce (MC) acceptance. They found that compatibility has a direct effect on perceived usefulness and behavioral intention to use. So in this research, we combine IDT and TAM, adding compatibility as an additional research construct. Previous studies have found that only relative advantage, compatibility, and complexity are consistently related to innovation adoption. It was also found that the two research constructs, PU and PEOU in TAM are very similar to relative advantage and complexity in IDT (Tung and Chang, 2007).

### Theoretical Framework

The research model of this research is as shown in Fig. 1. This research has modified it according to prior research on IDT and TAM (Wu and Wang, 2005). This research has integrated IDT, TAM, computer self-efficacy, information quality, perceived financial cost (PFC) and proposed a new hybrid technology acceptance approach to study users' acceptance of internet banking in Taiwan.

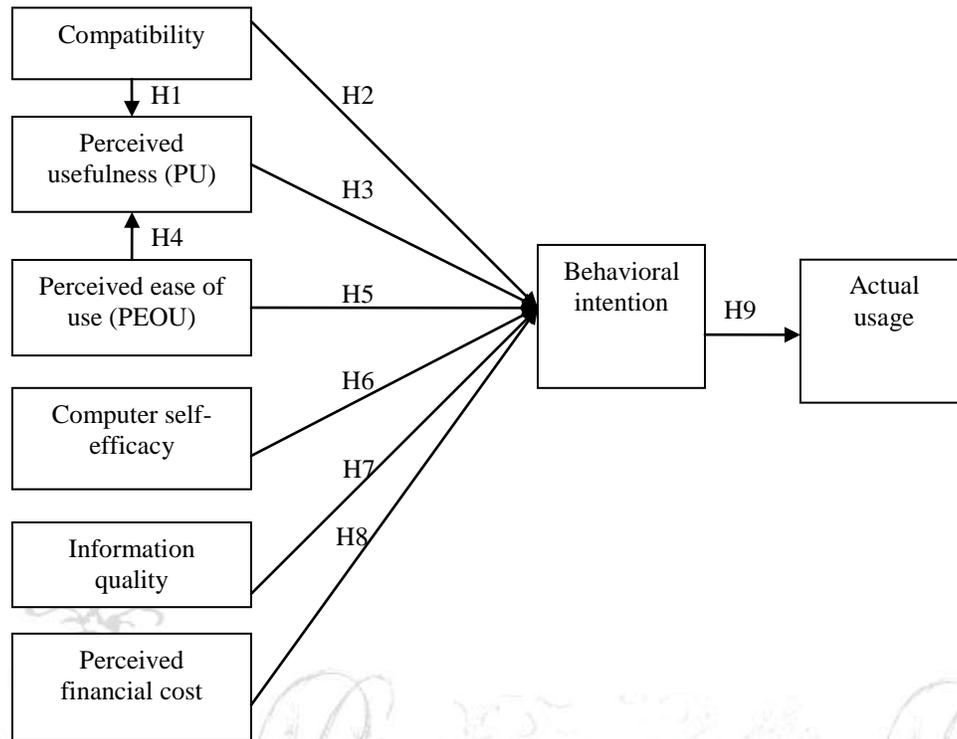


Fig. 1. Research model.

## Hypotheses

- H1. Compatibility will have a direct effect on perceived usefulness.
- H2. Compatibility will have a direct effect on behavioral intention to use the internet banking.
- H3. Perceived usefulness will have a positive effect on the behavioral intention to use the internet banking.
- H4. Perceived ease of use will have a positive effect on the perceived usefulness of the internet banking.
- H5. Perceived ease of use will have a positive effect on the behavioral intention to use the internet banking.
- H6. Computer self-efficacy will have a positive effect on the behavioral intention to use the internet banking.
- H7. Information quality will have a positive effect on the behavioral intention to use the internet banking.
- H8. Perceived financial cost will have a negative effect on the behavioral intention to use the internet banking.
- H9. The behavioral intention to use the internet banking will have a positive effect on the actual usage.

## Research Method

### Sampling Method

The sample for the study was taken from 1000 users who were using the internet banking in Taiwan. We sent 1000 questionnaires altogether in January 2010, and after two months, we had 831 returned in March 2010. The rate of response of the questionnaire was 81.3%. Of 813 basic questionnaires returned, we had to leave out 22 in which some questions had not been answered, leaving the number of valid questionnaires at 791.

**Sample Demographics**

Of the persons who filled out answers in this questionnaire 57.26% were male, and 42.74% were female. Most of them were 30 to 39 years old, making up 48.04% of the samples; the second largest group was those under 29, making up 34.26%. In regard to service seniorities, most of them had one to five years in service seniority, accounting for 49.94% of the sample. The majority of those replying to the questionnaire comprised people with longer than five years internet experience, and they made up 57.02% of the sample. Sample demographics are depicted thus in Table 1:

Table 1 Sample demographics

Gender	Age	Educational background	Work/Service Seniority	Internet Experience					
Male =	57.26%	≤ 29	34.26%	≤ College	82.42%	<1 year	12.01%	<3 years	8.21%
Female =	42.74%	30 -39	48.04%	Graduate	14.16%	1 to 5 years	49.94%	3 to 5 years	34.77%
		40-49	10.36%	Doctorate	3.42%	>5 years	38.05%	>5 years	57.02%
		≥ 50	7.34%						

**Methodology of Data Analysis**

The data were tested for reliability and validity using confirmatory factor analysis (CFA). The confirmatory model was used to determine whether the research model can explain the observed data. Next, structural equation modeling was employed to study the causal relationships among all the parameters in each model. The estimates were obtained using maximum likelihood estimation. These measures were calculated using SPSS 13.0 and LISREL 8.51 software.

**Analysis**

**Analysis of the Measurement Model**

The data obtained were tested for reliability and validity using confirmatory factor analysis (CFA). Hair et al., (1992) propose that Composite Reliability (CR) value greater than 0.5. CR consists of the total Reliability of all Individual Items.

Table 2 Cronbach's  $\alpha$ , CR and AVE

Construct	Cronbach's $\alpha$	CR	AVE
<b>C</b>	0.92	0.92	0.79
<b>PU</b>	0.95	0.94	0.82
<b>PEOU</b>	0.90	0.90	0.70
<b>CSE</b>	0.96	0.95	0.92
<b>IQ</b>	0.96	0.95	0.88
<b>PFC</b>	0.89	0.88	0.80
<b>BI</b>	0.99	0.99	0.98
<b>AU</b>	0.99	0.99	0.98

Compatibility( C), Perceived usefulness( PU), Perceived ease of use( PEOU), Computer self-efficacy(CSE), Information quality (IQ), Perceived financial cost( PFC), Behavioral intention to use( BI), Actual usage(AU)

Fornell and Larcker (1981) suggest that the composite reliability (CR) value should be greater than 0.6. The higher the average variance extracted (AVE), the higher the reliability and convergent validity that the potential constructs have. Fornell and Larcker (1981) propose that the AVE value should be greater than 0.5. Table 2 displays the Cronbach's  $\alpha$ , CR and AVE.

### Analysis of the Structural Model

The main purpose of the confirmatory analysis of the research model is to determine whether the theory model constructed by the researcher is instrumental in explaining the observed data. The various goodness-of-fit statistics are summarized in Table 3, and demonstrate the good overall fit of the measurement model to the data. Table 3 show that  $\chi^2/df = 1.94$ ; GFI = 0.92; AGFI = 0.90; NFI = 0.97; CFI = 0.98; RMSR = 0.067. The GFI was 0.92, which is greater than the 0.90 benchmark. The CFI here was 0.98, which is greater than the 0.90 benchmark suggested by Bentler (1989). The RMSR was less than 0.1 being 0.067.

Table 3 Goodness-of-fit measures of the research model

Fit Indices	$\chi^2/df$	GFI	AGFI	NFI	CFI	RMSR
Recommended Value	$\leq 3.0$	$\geq 0.9$	$\geq 0.8$	$\geq 0.9$	$\geq 0.9$	$\leq 0.1$
Result Value	1.94	0.92	0.90	0.97	0.98	0.067

The analysis results show that compatibility had a positive effect on both perceived usefulness ( $\gamma=0.26, P < 0.01$ ) and the behavioral intention to use ( $\gamma=0.28, P < 0.01$ ). Therefore, hypotheses H1 and H2 are supported. Perceived usefulness had a positive effect on the behavioral intention to use ( $\beta=0.03, P < 0.01$ ). This means that H3 is supported. Perceived ease of use had a positive effect on perceived usefulness ( $\gamma=0.14, P < 0.01$ ) and the behavioral intention to use ( $\gamma=0.10, P < 0.01$ ).

This means that H4 and H5 are supported. Computer self-efficacy had a positive effect on the behavioral intention ( $\gamma=0.10, P < 0.01$ ). This means that H6 is supported. Information quality had a positive effect on the behavioral intention ( $\gamma=0.27, P < 0.01$ ). This means that H7 is supported. Perceived financial cost had a negative effect on the behavioral intention to use the internet banking ( $\gamma=-0.16, P < 0.01$ ). This means that H8 is supported. The behavioral intention to use the internet banking had a positive effect on the actual usage ( $\beta=0.03, P < 0.01$ ). This means that H9 is supported.

### Conclusion

Using the new hybrid technology acceptance approach as a theoretical framework, this study helps practitioners and researchers better understand why people resist using the internet banking and increases user acceptance by improving the techniques and processes by which they are implemented. Major contributions are:

1. This research combined IDT and TAM, and proposed a new hybrid technology acceptance model.
2. Computer self-efficacy had a positive effect on the behavioral intention to use the internet banking.
3. Information quality had a positive effect on the behavioral intention to use the internet banking.
4. Perceived financial cost had a negative effect on the behavioral intention to use the internet banking.

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