

## **The Impact of Computer Self Efficacy and Technology Acceptance Model on Behavioral Intention in Internet Banking System**

Mohd Shoki.Md. Ariff\*

Yeow Siew Min

Norhayati Zakuan

Nawawi Ishak

Faculty of Management, Universiti Teknologi Malaysia

[m-shoki@utm.my](mailto:m-shoki@utm.my)

Khalid Ismail

Universiti Pendidikan Sultan Idris, Malaysia

— *Review of* —  
**Integrative  
Business &  
Economics**  
— *Research* —

### **ABSTRACT**

The aim of this paper is to determine acceptance of internet banking systems among potential young users, specifically future marketers, who significantly affect the continuous usage of internet banking service. It attempted to examine the impact of Computer Self Efficacy (CSE) and extended Technology Acceptance Model (TAM) on the behavioral intention (BI) to use the internet banking systems. Measure of CSE was based on the Self Service Technology, as proposed by Compaeu and Higgins. A technology acceptance model for internet banking system was developed based on the modified version of TAM to examine the effects of Perceived Usefulness (PU), Perceived Ease of use (PE) and Perceived Credibility (PC) of extended TAM on the BI to use the internet banking systems. PU and PE are the established dimensions of classical TAM and Perceived credibility (PC) is the additional dimension to be included in the conceptual model of this study. Data were obtained from 222 undergraduates marketing students in a Malaysia's public university. The finding indicated that CSE, PU, PE and PC of extended TAM were determinants of users' acceptance of internet banking systems. PU, PE and PC were significantly affected BI, and respondents' perceived credibility of the internet banking system had the strongest impact on their intention to use the system. This research validated that PU, PE and PC of the extended TAM were good predictors in understanding individual responses to information technology systems. The result of this study highlighted that issues of privacy and security of PC are important in the study of information systems acceptance, suggesting that internet banking providers need to address these issues effectively to convince potential users to use internet banking service. This study also validated the critical role of CSE in predicting individual responses to information technology systems. The finding unveiled that indirect relationship existed between CSE and BI through PU, PE and PC of TAM.

**Keywords:** TAM, Computer Self efficacy, Internet banking system, Behavioral intention

## 1.0 Introduction

### 1.1 The Importance of Potential Young Users in the Usage of Internet banking System

With the growing usage of internet banking worldwide, researches in internet banking are becoming important in services marketing. Pikkarainen *et al.* (2004) define internet banking as an internet portal, which offers different kinds of banking services ranging from bill payment to making investments. At the click of a mouse, internet banking gives customers the right to use almost any type of banking transaction (De Young, 2001). Without geographical constraint, almost all of the banks are using the internet as an additional channel or a direct delivery channel to offer their banking services on the internet.

Examining users' acceptance of internet banking system, especially potential young users' intention to use the system, is one area of great interest to researchers and managers to ensure banks' competitiveness is sustained. The evolution in internet banking studies has point out the importance of fulfilling the needs of potential internet banking users who significantly affect the level of internet banking acceptance. Previous studies in internet banking were silent to address specifically potential young users as their main target of researches (Ndubisi and Sinti, 2006). In Malaysia, as reported by the Malaysian Communications and Multimedia Commission in 2004, young internet users accounted to 12.3% of the total utilization of internet, thus providing huge future market in internet banking. This group of users consists of those between 15 – 25 years of age, and most of them are students in secondary schools and universities. Students in tertiary education are very important to internet banking providers because most of the future users of internet banking will come from this segment. As a result, understanding their behavior towards internet banking systems is crucial.

Although internet banking provides flexibility in performing financial transaction, fast and easy, however Malaysians are still reluctant to adopt the system because of issues of risks, lack of internet connection facilities, perceived credibility and computer literacy (Amin, 2007). Thus, examining users' acceptance of internet banking system among potential young users, especially students in tertiary education, is vital.

### 1.2 Computer Self Efficacy and Technology Acceptance Model; Their Influences on Behavioral Intention of Potential Young Internet Banking Users

Students in tertiary education are regarded as information technology literate and they are well exposed to the electronic business, and therefore, revealing the effect of their computer self-efficacy (CSE) on their behavioral intention (BI) towards internet banking systems is crucial. Review on the acceptance of internet banking systems researches involving Technology Acceptance Model (TAM) and BI suggested that users' perceived credibility (PC) of the systems, together with perceived usefulness (PU) and perceived ease of use (PE) of the classical TAM should be considered to predict BI of potential users to use the systems (Wang, et.al, 2003, Pikkarainen *et al.*, 2004, and Amin, 2007). Further, the external variables of individual differences, such as CSE, are extensively used by researchers to better explain how individual reacts to information systems (Compeau and Higgins, 1995). Therefore, this study develops a technology acceptance model for internet banking system based on the modified version of TAM to examine the effects of CSE and PU, PE and PC of TAM on the BI to use the internet banking systems. It extends the understanding on how potential young users response to information technology systems, i.e. internet banking system, from

Malaysia’s undergraduate students perspective.

## 2.0 Literature Review

### 2.1 TAM and its Influences on Users’ Behavior Intention towards Information Systems

There are different models that have been proposed to examine determinants of acceptance of information technology systems, for example diffusion of innovation model by Rogers (Lee, Lee, and Eastwood, 2003), Theory of Reasoned Action and Theory of Planned Behavior. Among the different models that have been proposed, the technology acceptance model (TAM) appears to be the most widely accepted model among information systems researchers (Davis, 1989, Davis, Bagozzi and Warshaw, 1989). As suggested by Agarwal and Prasad (1999), the reason for its popularity is perhaps because of its parsimony and the wealth of recent empirical support for it. Information systems researchers have investigated and replicated the TAM, and agreed that it is valid in predicting the individual’s acceptance of various corporate IT (Chin and Todd, 1995; Doll et al., 1998). TAM has been validated as a powerful and parsimonious framework for explaining the adoption of information technology by the users (Davis, 1989, Davis, Bagozzi and Warshaw, 1989) and has better empirical support in information technology researches (Wang, et.al, 2003 and Guriting and Ndubisi, 2006).

Based on the theories in social psychology, such as Theory of Reasoned Action (Ajzen and Fishbein, 1980) and Theory of Planned Behavior (Ajzen, 1985), TAM was introduced by Davis (1989), which stressed on adoption degree of a person in using a technology and aspects that affect his or her acceptance or intention to use the technology. TAM suggests that users’ adoption of information technology systems is determined by their intention to use the systems, which in turn is determined by their beliefs towards the system. Users’ beliefs about information technology systems are influenced by their perceived usefulness (PU) and perceived ease of use (PE) of the systems, as shown in Figure 1.

Fishbein and Ajzen (1975) suggested that a person’s adoption or actual behavioural could be determined by considering his or her prior intention along with his beliefs for a given behaviour. Thus, BI serves as an indicator of a person’s readiness to perform certain behaviour. It measures a person's relative strength of intention to perform behaviour (Davis, 1989), such as his intention to use information technology systems.

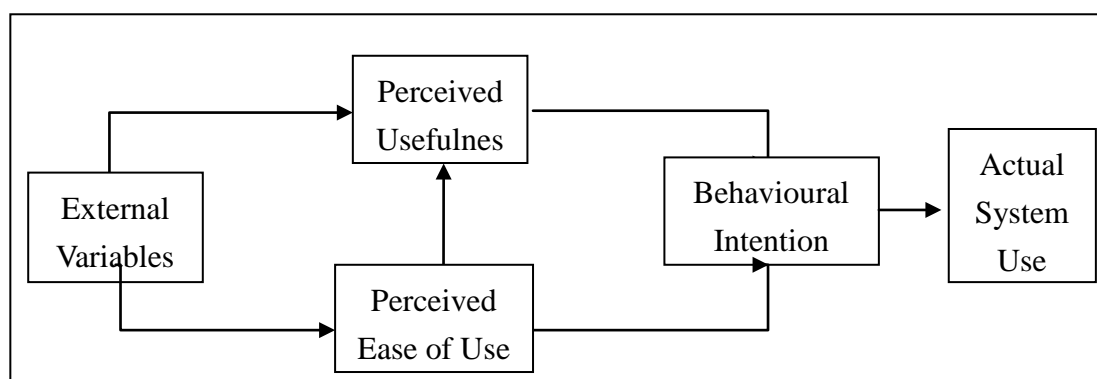


Figure 1: Final Version of Technology Acceptance Model (Venkatesh and Davis, 1996, p. 453)

In general, TAM is a theoretical model that evaluates the effects of things like system characteristics on user acceptance (Davis, 1985). It has been validated as a powerful and parsimonious framework for explaining the adoption of IT by the users (Davis, 1989; Davis *et al.*, 1989). Development of TAM has been studied over the years and Table 1 showed the chronological progress of TAM since 1986.

**Table 1: Chronological Progress of Technology Acceptance Model**

TAM Version	Founder, Year of established	Dimensions	Finding and Discussion
Original TAM	Davis, 1985	<ul style="list-style-type: none"> <li>• Perceived Ease of Use</li> <li>• Perceived Usefulness,</li> <li>• Attitude Toward Using</li> <li>• Actual System use</li> </ul>	<ol style="list-style-type: none"> <li>1. A positive correlation between the scales and self-predicted future usage.</li> <li>2. Behavioural intention to use should be included.</li> </ol>
First Modified TAM	Davis <i>et al.</i> , 1989	<ul style="list-style-type: none"> <li>• External Variables</li> <li>• Perceived Usefulness</li> <li>• Perceived ease of use</li> <li>• Attitude toward using</li> <li>• Behavioural intention to use</li> <li>• Actual System use</li> </ul>	<ol style="list-style-type: none"> <li>1. Both Perceived Usefulness and Perceived ease of use and have a direct influence on behavioural intention to use.</li> <li>2. Eliminate the need of Attitude toward using.</li> </ol>
Final version of TAM	Venkatesh and Davis, 1996	<ul style="list-style-type: none"> <li>• External variables</li> <li>• Perceived Usefulness</li> <li>• Perceived ease of use</li> <li>• Behavioural intention to use</li> <li>• Actual system use</li> </ul>	<ol style="list-style-type: none"> <li>1. Removing of attitude toward using eliminate any unexplained direct influence from system characteristic to the attitude.</li> <li>2. The need of extending the model to include other variables such as subjective norm, extrinsic motivations, playfulness and so on.</li> </ol>
TAM 2 (Extended)	Venkatesh and Davis, 2000	<ul style="list-style-type: none"> <li>• Subjective norm</li> <li>• Image</li> <li>• Job relevance</li> <li>• Output quality</li> <li>• Result demonstrability</li> <li>• Experience</li> <li>• Voluntariness</li> <li>• Perceived Usefulness</li> <li>• Perceived ease of use</li> <li>• Behavioural intention to use</li> </ul>	<ol style="list-style-type: none"> <li>1. Model performed well in both voluntary and mandatory environment except subjective norm</li> <li>2. Criticism for TAM fall in:                             <ol style="list-style-type: none"> <li>a. The methodology used for testing TAM model</li> <li>b. The variables and relationships exist within TAM model</li> <li>c. The core theoretical foundation underlying TAM model.</li> </ol> </li> </ol>

## 2.2 Extended Technology Acceptance Model

Venkatesh and Davis (1996) also noted that future technology acceptance research needs to address how other variables affect usefulness, ease of use, and user acceptance. Many researchers suggest that additional variables in TAM are required to derive a better understanding on determinant factors influencing the decision of bank users to use internet banking systems. Recent research has indicated that trust, privacy, security has a striking influence on user willingness to engage in online exchanges of money and personal sensitive information (Hoffman *et al.* 1999; Friedman *et al.*, 2000, in Wang, *et.al*, 2003). Thus, PC is added into the classical TAM (Wang, *et.al*, 2003, Amin, 2007). Perceived credibility is usually impersonal and relies on reputation, information and economic reasoning, and it is more related to one’s judgment on the privacy and security issues of the internet banking systems. Consequently, perceived credibility is used as a new construct to reflect the security and privacy concerns in the acceptance of internet banking (Wang, *et.al*, 2003, Amin, 2007).

PC is identified across many studies to have effect on users' intention to adopt the internet-based transaction systems, as shown in Table 2. Thus, the extended TAM – PU, PE and PC – was constructed in this study to determine the impact of TAM on BI to use internet banking system.

### **2.2.1 Perceived Usefulness**

According to the TAM, perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989). The significant positive impact of PU on BI in predicting information system acceptance, including internet banking system, is based on the theoretical argument of Wang *et al.* (2003), and Guriting and Ndubisi, (2006). Pikkarainen *et al.* (2004) applied TAM in Finland and they found that PU was a main factor of actual behavior of internet banking adoption. Result of the study of Tan and Teo (2000) revealed that the PU was a critical factor in determining adoption of innovations, including internet banking system. As a consequence, the greater the PU of using internet banking services, the more likely that internet banking will be accepted.

### **2.2.2 Perceived Ease of Use**

Perceived ease of use is one of the major variables in determining the internet banking intention and it is supported by many empirical studies. According to Davis (1989), PE refers to the degree to which a person believes that using a particular system would be free of effort. The relationships between PE on usage intention could be in the way of either direct or indirect. Extensive research over the years provides evidence of the significant effect of PE on usage intention (Venkatesh and Davis, 1996; Wang *et al.*, 2003; Eriksson, 2005; Guriting and Ndubisi, 2006). Chen and Barnes (2007) found that two technological aspects of the system interface, which are PE and perceived usefulness, significantly affect customer adoption intentions.

### **2.2.3 Perceived Credibility**

Perceived credibility is a new variable or construct that was added into the proposed TAM model. According to Wang *et al.* (2003), PC refers to the two important dimensions, namely security and privacy, which are identified across many studies as effecting intention by users to adopt the internet-based transaction systems. Both parties who are involved in the financial transaction, banks and customers are taking high risk in dealing with electronic transactions. An individual will switch from doubts about the privacy of personal information to worries of financial loss (Sayar and Wolfe, 2007). In fact, both of the security and privacy issues in most of the studies are proven to have a significant impact on the acceptance of internet banking. The consequence of security and privacy to the acceptance of internet banking has been noted in many banking studies (for example, Sathye, (1999), Pikkarainen *et al.*, 2004). Ramayah and Ling (2002) found that the respondents placed security as one of the important factors when adopting Internet banking. PC was found to be significant obstacles to the adoption of online (Wang, *et.al*, 2003). In Malaysia, Suganthi and Balachandran (2001) found that one of the important factors affecting internet banking adoption is security concerns.

## **2.3 The Role of Computer Self Efficacy in the Acceptance of Information Technology Systems**

Current researches in predicting acceptance of information technology systems suggested the inclusion of external variable, such as compliance to regulation, accessibility, CSE, etc., which might influence the beliefs of a person towards acceptance of the systems. Venkatesh and Davis (1996) proposed a conceptual model with consideration of external variable, which might influence the beliefs of a person towards acceptance information systems. Several important external

variables that have received more and more attention in the context of TAM research are individual differences, such as computer self-efficacy. CSE plays a vital role in shaping an individual's feeling and behavior Compeau and Higgins (1995). CSE is the judgment of one's ability to use a computer and this ability would lead to more favorable behavioral intention through its influence on PU and PE (Wang, et.al, 2003; Pikkarainen *et al.*, 2004). Generally, individuals with high efficacy expectations are more likely to succeed in a given task. It means a high self-efficacy individuals work harder and longer than low self-efficacy individuals, which is stated in the study of Wood and Bandura (1989).

Compeau and Higgins (1995) discussed three discrete but interrelated dimensions of self-efficacy. In the context of computer usage, these involved magnitude, strength, and generalizability. Based on these dimensions, individuals with a high computer self-efficacy magnitude would evaluate themselves as competent of operating with less assistance than those with lower computer self-efficacy magnitude. On the other hands, individuals would expect to be capable use various software packages and different computer systems if they are perceived as high computer self-efficacy generalizability. At the same time, individuals with low computer self-efficacy will more likely to be frustrated by obstacles.

The significant positive impact of CSE on PU and PE of TAM was based on the theoretical argument of Davis (1989); Wang *et al.* (2003) and Guriting and Ndubisi (2006). Over the years, previous studies such as Venkatesh, (2000); Venkatesh and Davis, (1996) have reaffirmed that there are significant effects of computer self-efficacy on PU and PE of TAM.

However, existence concerns regarding perceived credibility of the online transactions will negatively affected by CSE. It is based on the theoretical argument by Wang *et al.* (2003) and Guriting and Ndubisi (2006). The results in the study of Wang *et al.* (2003) indicated that computer self-efficacy will have a negative effect on perceived credibility of the internet banking. It means the higher ability of one in computer skills, the less security and privacy issues will be concerned.

Prior researches have suggested a positive relationship between experience with computing technology and the effect towards computer usage (Agarwal and Prasad, 1999). Compeau and Higgins (1995) reported that computer self-efficacy plays a vital role in shaping an individual's feeling and behavior. Other researches such as Venkatesh and Davis (2000) proposed that a training mechanism that is designed to improve computer self-efficacy is more likely to increase user acceptance.

## 2.4 The Conceptual Model of the study

Review of the literature, as discussed above, indicated that the predictors of internet banking users' acceptance are PU, PE and PC of extended TAM. CSE, as external variable, was extensively used in the study of users' acceptance of information technology systems, and therefore, should be incorporated in TAM to better explain individual BI towards an information system. The summary of international studies utilizing CFE and PU, PE and PC of TAM in the users' acceptance of internet banking system is presented in Table 2. Thus, a conceptual model of a technology acceptance model for internet banking system was developed to examine users' acceptance of internet banking system. This model features CSE, as external variable, and PC to be integrated with PU and PE of TAM, in predicting BI of potential young users to use the system.

Based on the proposed conceptual model, six specific hypotheses were developed in this study. The hypotheses are:

**H1:** Computer self-efficacy will have a positive impact on perceived usefulness

of the behavioral intention to use Internet banking.

**Table 2: Summary of International Studies Utilizing CFE and TAM in the Users' Acceptance of Internet Banking System**

Studies	Variables			PC	
	CSE	PU	PE	Security	Privacy
Chau and Lai (2003)		√	√		
Wang, Y. S., Wang, Y.M., Lin, H. H. and Tang T.I. (2003)	√	√	√	√	√
Pikkarainen, T., Pikkarainen K., Karjaluoto, H. and Pahnla S. (2004)		√	√	√	√
Chan and Lu (2004)	√	√	√		
Eriksson (2005)		√	√		
Cheng, T.C.E., Lam, D.Y.C., Yeung, A.C.L. (2006)		√	√	√	
Guriting and Ndubisi (2006)	√	√	√		
Amin. H (2007)	√	√	√	√	√
Juan Carlos Roca, Juan José García, Juan José de la Vega, (2009)		√	√	√	√

**H2:** Computer self-efficacy will have a positive impact on perceived ease of use of the behavioral intention to use Internet banking.

**H3:** Computer self-efficacy will have a negative impact on perceived credibility of the behavioral intention to use Internet banking.

**H4:** Perceived usefulness will positively affect the behavioral intention to use internet banking.

**H5:** Perceived ease of use will positively affect the behavioral intention to use internet banking.

**H6:** Perceived credibility will positively affect the behavioral intention to use internet banking.

### 3.0 Methodology

This is a descriptive survey attempting to examine behavioral intention of potential young internet banking users to use internet banking system. A questionnaire was developed based on extensive review on theories and previous researches related to determinant factors of users' acceptance of information systems.

A total number of 29 items was constructed in this study to measure the independent variables – CSE and PU, PE and PC of TAM and BI, a dependent variable. In this study:

- Seven items were used to measure CSE based on the theory of Self Service Technology by Compaeu and Higgins (1995).
- Six items for each PU and PE of TAM were adapted from Davis (1989).

PC was included in the TAM model with five items based on the work of Pikkarainen *et al.* (1994).

- BI was measured using five questions which were adapted from Davis (1989).

All measurements are based on five-point Likert scales ranging from “strongly disagree” (1) to “strongly agree” (5).

All marketing undergraduate students (222 students), who are pursuing their degrees in a Malaysia’s public university served as a population of this study. The selection of marketing students are based on two criterion: (i) They are web-educated and possess high computer-skilled, in which the concept of internet banking is not an alien for them; and (ii) They represented a demographic segments who possess varying computer expertise and at the same time, are well-exposed to e-business and internet-based services. These characteristics are well suited with the requirements of becoming potential internet banking users. 222 questionnaires were distributed to the students and with the assistance of some lecturers, the researchers managed to collect all completed questionnaires for further analysis.

### 3.2 Measurement Assessment

In this study, the KMO measure of sampling for CSE and TAM (PU, PE and PC) and BI were above 0.80, supported by Bartlett’s test of Sphericity of 0.00, allowing the research to proceed with factor analysis. For CSE, the results of Total Variance Explained of Confirmatory Factor Analysis (CFA) indicated that only one dimension, i.e. CSE, in the initial solution with eigenvalues greater than 1.0 has been extracted with the cumulative percentage of 61.719%. Six out of seven items in CSE were accepted based on the results on component matrix with factor loading more than 0.5. Item CSE 1 (I could complete my banking transactions using the internet banking systems if there is no one around tell me what to do) was neglected due to factor loading of 0.462. Results of CFA were presented in Table 3.

Further, the rotated component matrix of CFA yielded three components, i.e. the three proposed dimensions of TAM (PU, PE and PC) with the cumulative percentage of 65.238%. All items in the proposed PU, PE and PC were retained based on the results of component matrix with factor loading  $\geq 0.5$  (refer to the results of CFA in Table 3).

For BI, the Total Variance Explained indicated that only one dimension, i.e. BI, in the initial solution with eigenvalues greater than 1.0 has been extracted with the cumulative percentage of 68.348%. All five items of BI were accepted based on the results on component matrix with factor loading more than 0.5.

As in previous studies, Cronbach’s alpha was used as reliability analysis to measure the degree of consistency and correlation with each other. The higher the alpha value, the better the measured items. As presented in Table 4, the alpha value for CSE was 0.746 and the values for PU, PE, PC and BI were 0.892, 0.893, 0.890 and 0.809 respectively. Thus, construct of CSE, TAM and BI used in this study was reliable and valid for further analysis.

## 4.0 Results

### 4.1 Profile of Respondents

All marketing students (222 students) in a Malaysia Public University participated in this study. As shown in Table 5, characteristics of the respondents are summarized as follow:



- 158 were female respondents (71.2%) and 64 were male respondents (28.8%).

**Table 3: Results of CFA on CSE, TAM and BI**

	Component			
	1	2	3	4
CSE1	.357	.215	.119	.462
CSE2	.020	.104	.003	<b>.690</b>
CSE3	.281	.000	-.057	<b>.582</b>
CSE4	.087	.075	.127	<b>.744</b>
CSE5	-.005	.060	.039	<b>.683</b>
CSE6	.041	.151	.063	<b>.525</b>
CSE7	.272	.200	.052	<b>.614</b>
PU1	<b>.719</b>	.234	.079	.134
PU2	<b>.774</b>	.258	.157	.071
PU3	<b>.721</b>	.201	.168	.120
PU4	<b>.706</b>	.267	.153	.115
PU5	<b>.755</b>	.320	.145	.111
PU6	<b>.733</b>	.225	.160	.227
PE1	.278	<b>.752</b>	.082	.115
PE2	.353	<b>.729</b>	.076	.169
PE3	.284	<b>.766</b>	.050	.195
PE4	.212	<b>.792</b>	.189	.134
PE5	.249	<b>.694</b>	.314	.143
PE6	.389	<b>.544</b>	.255	.171
PC1	.131	.292	<b>.719</b>	.092
PC2	.134	.154	<b>.744</b>	.089
PC3	.159	.040	<b>.845</b>	.033
PC4	.086	.072	<b>.889</b>	.035
PC5	.181	.120	<b>.830</b>	.035

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

- The first year students were the minority group in this study with 59 respondents (26.6%), followed by second year students with 81 respondents (36.5%) and lastly, the third year students (82 respondents; 36.9%).
- Chinese respondents represented the major category with 125 respondents (56.3%). The second highest category of race was Malay with 93 respondents (41.9%), other races showed the minority race group in this study, only 4 respondents.

**Table 4: Reliability Coefficients**

No.	Dimension	No. of Items	Cronbach's Alpha
1	Computer Self Efficacy	6	0.746
2	Perceived Usefulness	6	0.892
3	Perceived Ease of Use	6	0.893
4	Perceived Credibility	5	0.890
5	Behavioral Intention	5	0.809

**Table 5: Demographic Characteristics of the Respondents**

Demographic	Category	Frequency	Percentage (%)
Gender	Male	64	28.8
	Female	158	71.2
Year of Study	1	59	26.6
	2	81	36.5
	3	82	36.9
Ethnic Origin	Malay	93	41.9
	Chinese	125	56.3
	Others	4	1.8

#### **4.2 The Impact of Computer Self-Efficacy on Perceived Usefulness, Perceived Ease of Use and Perceived Credibility (TAM) of the Behavioral Intention to use the Internet Banking System**

As illustrated in Table 6, the multiple regression analysis indicated that CSE has a positive effect on PU (Regression 1 -  $\beta$  0.380,  $t$  6.086, Sig. 0.001) and PE (Regression 2 -  $\beta$  0.389,  $t$  6.265, Sig. 0.001) of the Internet banking systems. Thus, H1 and H2 were accepted denoting respondents' CSE will influence their intention to use the systems. However, H3 was rejected indicating that respondents' CSE was positively affecting their PC of the systems (Regression 3 -  $\beta$  0.169,  $t$  2.546, Sig. 0.012). It implied that the higher the ability of one in computer skills, the higher the security and privacy issues of PC will be concerned.

**Table 6: Results on the impact of CSE on PU, PE, and PC (TAM) of the behavioral intention to use the internet banking system**

Hypothesis		Regression 1	Regression 2	Regression 3
	(Constant)	<b>CSE</b> 2.330	<b>CSE</b> 2.006	<b>CSE</b> 2.630
<b>H1:</b> Computer self-efficacy will have a positive impact on perceived usefulness of the behavioral intention to use Internet banking.	<b>PU (<math>\beta</math>)</b> t-value p-value VIF	0.380 6.086 0.000** 1.000		
<b>H2:</b> Computer self-efficacy will have a positive impact on perceived ease of use of the behavioral intention to use Internet banking.	<b>PE (<math>\beta</math>)</b> t-value p-value VIF		0.389 6.265 0.000** 1.000	
<b>H3:</b> Computer self-efficacy will have a negative impact on perceived credibility of the behavioral intention to use Internet banking	<b>PC (<math>\beta</math>)</b> t-value p-value VIF			0.169 2.546 0.012* 1.000
Note: * p<0.05; ** p<0.01	F statistic R <sup>2</sup>	37.039 0.144	39.247 0.151	6.483 0.029

### 4.3 The Impact of Perceived Usefulness, Perceived Ease of Use and Perceived Credibility of TAM on Behavioral Intention

As presented in Table 7, the multiple regression analysis indicated that the three construct of TAM – PU, PE and PC – were significantly associated with BI (Regression 4). Specifically, PU ( $\beta$  0.226, t 3.155, Sig. 0.002), PE ( $\beta$  0.201, t 2.274, Sig. 0.006) and PC ( $\beta$  0.352, t 6.018, Sig. 0.001) have a positive effect on respondents' intention to use the internet banking systems. Thus, all the H4, H5 and H6 were supported.

### 4.3 The Total Impact of Computer Self-Efficacy and TAM on Behavioral Intention

The calculation on the total effects of CSE and TAM on BI (the indirect effect of CSE on BI through TAM; and the direct effect of TAM on BI) was tabulated in Table 8. It was found that the marketing students' CSE indirectly affects their BI to use the internet banking systems through PU, PE and PC of TAM. The total indirect effect is accounted 0.223. TAM was found to have direct effects on respondents' BI to use the systems. The total direct effect is 0.779. Thus, both CSE and the three constructs of TAM were found to have significant influence on users' BI to use the internet banking systems.

**Table 7: Results on the impact of Perceived Usefulness, Perceived Ease of Use and Perceived Credibility of TAM on Behavioral Intention**

Hypothesis		Regression 4	
	(Constant)	<b>BI</b> 1.214	
<b>H4:</b> Perceived usefulness will positively affect the behavioral intention to use internet banking.	<b>PU (<math>\beta</math>)</b>	0.226	
	t-value	3.155	
	p-value	0.002*	
	VIF	1.852	
<b>H5:</b> Perceived ease of use will positively affect the behavioral intention to use internet banking.	<b>PE (<math>\beta</math>)</b>	0.201	
	t-value	2.774	
	p-value	0.006*	
	VIF	1.888	
<b>H6:</b> Perceived credibility will positively affect the behavioral intention to use internet banking.	<b>PC (<math>\beta</math>)</b>	0.352	
	t-value	6.018	
	p-value	0.000**	
	VIF	1.229	
Note: * p<0.05; ** p<0.01		F statistic	47.248
		R <sup>2</sup>	0.394

**Table 8: Calculation on the total effects of Computer Self-Efficacy and TAM on Behavioral Intention**

	Total effects of CSE on BI	Total effects of TAM on BI
<b>The undergraduate marketing students</b>	= <b>indirect effect (through TAM)</b> = (0.380*0.226) + (0.389*0.201) + (0.169*0.352) = 0.223	= <b>direct effect</b> = 0.226 + 0.201 + 0.352 = 0.779

The graphic representation of the results was shown in Figure 2. CSE was able to explain 14.4% of the variance in PU, 15.1% of the variance in PE and 2.9 % of the variance in PC. On the other hand, there are a total of 39.4% of the variance in BI was explained by TAM model - PU, PE and PC. These results are coherent with the final version of TAM model proposed by Venkatesh and Davis (1996). All the major variables in the technology acceptance model were well adopted in predicting individual behavior intention towards an information technology system.

**5.0 Discussion**

This study examined users’ acceptance of information system, specifically acceptance of potential young users towards internet banking system. Based on the Copyright © 2013 Society of Interdisciplinary Business Research (www.sibresearch.org)

multiple regression analyses of this research, the users' acceptance of information systems can be discussed in four perspectives, as follow:

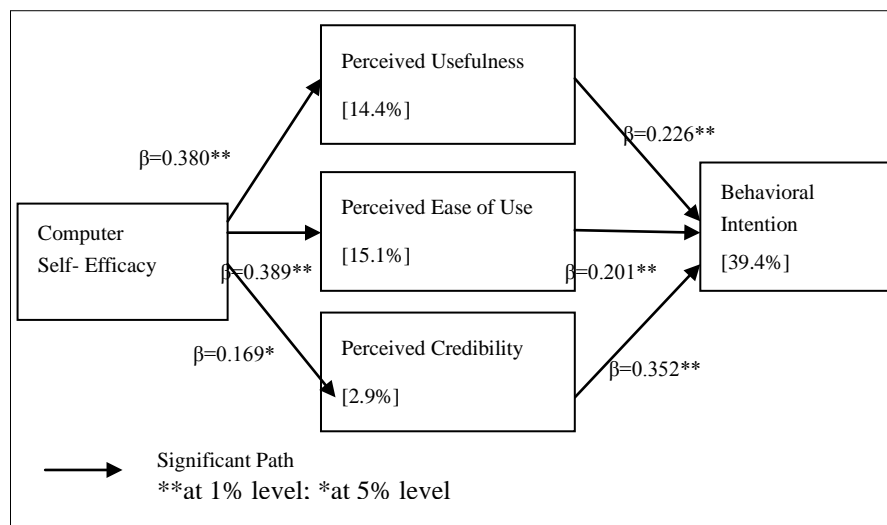


Figure 2: The final model

- The multiple regression analysis indicated that CSE has a positive impact on PU of the Internet banking systems. The result is consistent with the work of Guriting and Ndubisi (2006) and Amin (2007). The positive effects of CSE on PE of TAM in the internet banking systems are consistent with previous researches (Wang, et.al, 2003 and Guriting and Ndubisi (2006). On the contrary, the positive effect of CSE on PC shows that the higher the ability of one in computer skills, the higher the security and privacy issues will be concerned. This is inconsistent with the study of Wang *et al.* (2003) who found negative effect of CSE on PC, i.e. the higher the ability of one in computer skills, the less security and privacy issues of PC will be concerned.
- The results on the positive impact of all construct of extended TAM on BI were consistent with previous research findings. Specifically, the effect of PU (Wang *et al.*, 2003 and Guriting and Ndubisi, 2006), PE (Venkatesh and Davis, 1996; Wang *et al.*, 2003 and Guriting and Ndubisi, 2006), and PC (Ndubisi and Sinti, 2006; Guriting and Ndubisi; 2006; and Pikkarainen et.al. 2004) on BI were well supported. Thus, it can be concluded that the integration of PC with PU and PE in TAM will definitely help researchers to better explain individual intention to use internet banking systems. In fact, PC was found to have stronger influence than PU and PE on BI, indicating that issues of privacy and security of internet banking systems are important and they must be well addressed in banks' promotion effort to convince young users to use the internet banking services.
- Venkatesh and Davis (1996) propose the inclusion of external variable into the TAM to predict consumers BI and the actual use of information technology systems. The CSE, as the external variable, was employed by many researchers to predict its effect on BI (Wang *et al.*, 2003; Guriting and Ndubisi, 2006 and Amin, 2007). The finding of this study supported this formation, in which: (i) users CSE was found to have significant positive effect on TAM; and (ii) the users CSE is indirectly influence, through PU, PE and PC of TAM, their BI to use the internet banking systems. This suggests that bank managers should consider potential users literacy in information technology in their effort to convince them to use the internet

banking. The potential users CSE will influence their perception towards perceived usefulness, ease of use and credibility of the internet banking system, thus influencing their acceptance of and intention to use the system.

- The formation of CSE, TAM and BI to predict individual response to information technology systems. The conceptual model of this study employed this formation. The results of this study revealed that: (i) users' CSE was found to have significant positive effect on all constructs of TAM; (ii) PU, PE and PC of TAM significantly influence users' intention to use the internet banking systems; and (iii) the users' CSE is indirectly influence, through PU, PE and PC of TAM, their BI to use the internet banking systems. Thus, this formation is able to predict potential users' intention to use information systems, including internet banking system.

## 6.0 Conclusion

This research had revealed that CSE, and PU, PE and PC of the extended TAM had significant effect on users' BI to use internet banking systems. This indicated that the higher the magnitude of CSE, PU, PE and PC by customers; the higher will be their intention to use the systems. The inclusion of PC with PU and PE in the TAM model contributed to the better understanding on how individuals react, in term of exerting their intention, to use information technology systems. Thus, the integration of PC in the classical TAM model to predict consumers BI is well supported. In fact, PC ( $\beta$  0.352) has been found to have stronger influence than PU ( $\beta$  0.226) and PE ( $\beta$  0.201) on users' BI to use internet banking systems.

The finding of this study had validated that the external variable in the formation of TAM and BI (Venkatesh and Davis, 1996), such as CSE (Compeau and Higgins, 1995 and Wang, et.al, 2003), is crucial in determining predictors of technology use intention. In this study, CSE serves as indirect impetus, through TAM, to enhance users' PU, PE and PC of internet banking systems. Thus, CSE is very influential in facilitating users' acceptance of the systems.

## References

- [1] Agarwal, R. and Prasad, J. (1999), "Are individual differences germane to the acceptance of new information technologies?" *Decision Sciences*, Vol. 30 No. 2, pp. 361-391.
- [2] Ajzen, I., "From intentions to actions: a theory of planned behavior", in Kuhl, J. and Beckmann, J. (Eds), *Action Control: From Cognition to Behavior*, Springer-Verlag, (1985), NY, pp. 11-39.
- [3] Ajzen, I. and Fishbein, M. 'Understanding Attitudes and Predicting Social Behavior'. (1980) Prentice- Hall, Englewood Cliffs, NJ.
- [4] Amin, H. 'Internet banking adoption among young intellectuals'. *Journal of Internet Banking and Commerce*, (2007), 12 (3), 1-13.
- [5] Chan, S., and Lu, M. (2004). Understanding internet banking adoption and use behavior: A Hong Kong perspective. *Journal of Global Information Management*, 12(3), 21-43.
- [6] Chau, K. Y., Patrick and Lai, S., K., Vincent. (2003). An empirical investigation of the determinants of user acceptance of Internet Banking. *Journal of Organizational Computing and Electronic Commerce*, 13, 2, 123-145.
- [7] Chen Y.H, Barnes S (2007). Initial trust and online buyer behavior. *Ind. Manage. Data Syst.* 107 (1), 21-36.
- [8] Cheng, T.C.E., Lam, D.Y.C., Yeung, A.C.L. (2006), "Adoption of internet banking: an empirical study in Hong Kong", *Decision Support Systems*, Vol. 42 No.3, pp.1558-72.

- [9] Compeau, D. R., and Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, 19, 189-211.
- [10] De Young, J. (2001). The Internet's place in the banking industry, *Chicago Fed Letter*, No.163, pp1-4.
- [11] Davis, F. D. (1989) Perceived usefulness, Perceived Ease of use and user acceptance of information technology, *MIS Quarterly*, Vol. 16 (2), 319-340.
- [12] Davis, F., Bagozzi, R.P. and Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, Vol. 35 No. 8, pp. 982-1003.
- [13] Eriksson K, Kerem K, Nilsson D (2005). Customer acceptance of internet banking in Estonia, *Int. J. Bank Mark.* 23 (2), 200-216.
- [14] Fishbein, M. and Ajzen, I. (1975), Belief, attitude, intention and behavior: an introduction to theory and research, *Addison-Wesley, Reading, MA*.
- [15] Guriting, P., and Ndubisi N.O. (2006). Borneo online banking: Evaluating customer perceptions and behavioral intention. *Management Research News*, 29 (1/2), 6-15.
- [16] Juan Carlos Roca, Juan José García, Juan José de la Vega, (2009) "The importance of perceived trust, security and privacy in online trading systems", *Information Management & Computer Security*, Vol. 17 Iss: 2, pp.96 – 113.
- [17] Lee, E., Lee, J. and Eastwood, D., "A two- step estimation of consumer adoption of technology - based service innovations", *Journal of Consumer Affairs*, (2003), Vol. 37 No. 2, pp. 256-82.
- [18] Ndubisi, N.O., and Sinti, Q. (2006). Consumer attitudes, system's characteristics and Internet banking adoption in Malaysia. *Management Research News*, 29 (1/2), 16-27.
- [19] Pikkarainen, T., Pikkarainen K., Karjaluoto, H. and Pahnla S. (2004) Consumer acceptance of online banking: an extension of technology acceptance model. *Internet Research*, 14(3), 224 235.
- [20] Ramayah, T., and Ling, K.P. (2002). An exploratory study of Internet banking in Malaysia. *The proceedings of the third International Conference on Management of Innovation and Technology*, Hangzhou City, China, 25-27 October 2002.
- [21] Sathye, M. (1999). Adoption of Internet banking by Australian consumers: An empirical investigation. *International Journal of Bank Marketing*, 17 (7), 324-334.
- [22] Sayar, C. and Wolfe, S. (2007). Internet banking market performance: Turkey versus the UK. *International Journal of Bank Marketing*, 25 (3), 122-141.
- [23] Suganthi, B., and Balachandran, G. (2001). Internet banking patronage: An investigation of Malaysia. *Journal of Internet Banking and Commerce*.
- [24] Tan M, Teo TSH (2000). Factors influencing the adoption of internet banking. *J. Assoc. Info. Syst.* 1(5): 22-38.
- [25] Venkatesh V, Davis FD (1996). A model of the antecedents of perceived ease of use: development and test. *Decis. Sci.* 27(3), 451- 481.
- [26] Venkatesh, V. and Davis, F. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, Vol. 46 (2), 186-204.
- [27] Wang, Y. S., Wang, Y.M., Lin, H. H. and Tang T.I. (2003) Determinants of user acceptance of Internet banking: An empirical study, *International Journal of Service Industry Management*, Vol. 14 (5), 501-519.
- [28] Wood, R.E. and Bandura, A. (1989): Social cognitive theory of organizational management, *Academy of Management Review*, 14: 361–384.