ABSTRACT

The purpose of this study is to develop a theoretical model based on the tripartite model of attitude to examine consumers’ intention to use mobile banking. The proposed model was empirically validated by survey method that collected 262 valid data in this study. The results of the analysis show that relative advantage, personal innovativeness, and compatibility have a positive relationship with consumer’s intention, and switching cost has the negative impact on consumer’s intention.

KEYWORDS: Compatibility; Complexity; Habit; Mobile Banking; Personal Innovativeness; Relative Advantage; Switching Cost and Tripartite Model of Attitude

INTRODUCTION

Mobile banking is not a new IT application. Mobile banking was first introduced as a banking channel in early 2000s in form of short messaging service (SMS), and later via wireless access protocol (WAP). Recently, with the advancement of information and communication technology (ICT) and the popularity of M-commerce, the environment for mobile banking nowadays is different from the time when the concept of mobile banking was first announced. In general, mobile banking can be defined as a banking service that enables consumers to access various banking services via mobile devices (such as smart phone, tablets or PDA) (Laukkanen & Lauronen, 2005). Mobile banking is a value-added service which enables customers to have banking services at anytime and anywhere, and brings great convenience to consumers (Zhou, 2012a; Zhou, 2011; Riivari, 2005; Mallat et al., 2004) compared with traditional banking services (such as ATM, telephone banking, and non-mobile Internet banking. Since mobile banking is conducted through mobile devices, users can access banking services anywhere they want, that is, a real always-on banking service. This feature, a real always-on banking service, is especially important for time-critical consumers (Singh et al., 2010), making mobile banking being the cheapest banking services delivery channel (Koenig-Lewis et al., 2010).

Both mobile banking and Internet banking are classified as electronic banking (Laforet & Li, 2005; Laukkanen, 2007; Sripalawat et al., 2011) and are two alternative channels for banks to provide their services (Scornavacca & Hoehle, 2007). Technically, mobile banking is conducted on mobile devices and wireless network connection. Whereas, Internet banking service is simply referred as online banking services. From users” point of view, the main difference between mobile banking and Internet banking is mobility (Suoranta & Mattila, 2004). Mobile banking are much more welcomed by people living in remote villages where Internet is hard to access (Cruz et al., 2010), where communication infrastructures are not well constructed and the density of branches of banks are low.
Several surveys (Flurry, 2014; Google, 2013) indicated that browsing Internet, playing games, using social network applications, and other entertainment are the four main activities users doing with their mobile devices. Mobile banking is barely adopted by 8.2% of customers (CNNIC, 2012). Moreover, there was no more than 2.3% of banking transaction conducted on mobile devices in Taiwan (Market Intelligence Center of Taiwan, MIC, 2009). Despite the popularity of mobile devices used, the usage rate of mobile banking remains much lower than expected (Yu, 2012; Cruz et al., 2010; Datamonitor, 2009).

Banks expect to gain more competitive advantages than other competitors by having a large number of customers’ adoption of mobile banking (Zhou, 2012b). Two corporations, Taiwan Mobile and Taipei Fubon Bank first adopted short message service (SMS) as the mobile banking service in Taiwan in 1999. Wireless application protocol (WAP) was then introduced into Taiwan in 2000. By 2010, mobile banking was performed on smart phone application including iOS and Android OS. Four banks (CTBC Bank, Cathay United Bank, E.SUN Bank and Citibank Taiwan) proposed their mobile banking applications for mobile devices. Nowadays, there are fourteen banks that have released their own mobile banking service applications. Each of these banks also provides Internet banking service. These mobile banking applications are better in usability, functionality and user interface than ever.

Although there are many advantages of using mobile banking, but mobile banking still suffers from the problems that e-commerce and M-commerce encounter such as great uncertainty and risk (Zhou, 2011). The user interface is limited due to the small screen and keypad compared with PC (Lee & Chung, 2009), which enhances the barriers for consumers to switch from Internet banking to mobile banking. Without a specific encryption standard, customers worry that their personal information might be accessed illegally (Lin, 2011). To have further understanding of prior researches in the adoption of mobile banking, related literatures were reviewed.

First, perceived cost plays an essential role in the adoption of mobile banking and its contribution is empirically validated (Hanafizadeh et al., 2014; Yu, 2012; Luarn & Lin, 2005; Ha et al., 2012). However, the previous studies mainly focused on the aspect of perceived financial cost (Chen, 2013; Yu, 2012; Luarn & Lin, 2005). Ha et al. (2012) called for more researches on indirect costs. Since financial cost is part of switching cost (Burnham et al., 2003) and the effect of switching cost is not yet confirmed in the context of the adoption of mobile banking (Zhou, 2012a), this study discussed the effect of switching cost instead of purely perceived financial cost. Moreover, from the point of view of status quo bias, the concept of switching cost provides a comparison between current status and changed status. Lin (2011) indicates that more comparisons of users’ previous experience are needed to provide further understanding of users’ intention on adopting mobile banking. Along with switching cost, habit is also considered as a critical factor to represent the attitude of past behavior (Hong et al., 2011). Thus, this study adopted switching cost and habit to conduct experiential comparison.

Secondly, self-efficacy is a common factor that influences users’ intention directly and indirectly in the study of adoption of mobile banking (Zhou, 2012a; Luo et al., 2010; Gu et al., 2009; Luarn & Lin, 2005). According to Luo et al. (2010) self-efficacy is one of the important factors that can reflect personal traits. Not only self-efficacy, there are merely few factors that reflect personal differences. Ha et al. (2012) collected more researches on personal characteristics in the context of mobile banking. Although, in recent years, trust is empirically validated as a critical factor to the adoption of mobile banking, Zhou (2012a) argued that the building of initial trust might be different for any potential individual. Since personal innovativeness is an important factor that can express individual differences (Bhattacherjee et al., 2012), this study adopted personal innovativeness as a tool to investigate the personal psychological aspect.

Thirdly, innovation attributes proposed by Rogers (1995) are good drivers in the study of users’ adoption of mobile banking (Chen, 2013; Lin, 2011). Among these five attributes, relative
advantage, compatibility and complexity are found to be the most important factors (Lin, 2011; Hanafizadeh et al., 2014; Chen, 2013; Ha et al., 2012). The validity of relative advantage in Lin’s research (2011) was validated Chen (2013). Compatibility performs as an influential factor in many researches (Hanafizadeh et al., 2014; Chen, 2013; Lin, 2011; Ha et al., 2012). The role of compatibility for adoptions of mobile banking can't be underestimated.

Last but not the least, to have further understanding of users’ adoption of mobile banking, the overall evaluation is essential (Luo et al., 2010; Zhou, 2012b). Luo et al. (2010) also argues that studies that simply focus on either cost or benefit aspect will yield incomplete or contradictory findings. Since the previous researches of attitude tend to focus on cognitive dimension of attitude (Hong et al., 2011), this study investigated the attitude in a more complete way. Bizer (2004) argued that attitude is the overall evaluation of cognitive, affective and behavior dimensions. Thus, this study adopted the tripartite model of attitude from psychology literature to investigate attitudes in a more comprehensive way.

LITERATURE REVIEW

Tripartite Model of Attitude

In the psychology literature, the tripartite model of attitude is a classic model that suggests that attitude comes from different sources including affective, behavioral, and cognitive (Bizer, 2004; Breckler, 1984). According to the tripartite model of attitude, attitude is the overall evaluation of these three components (Bizer, 2004; Eagly & Chaiken, 1993). The cognitive component refers to an individual’s thoughts, beliefs, and perceptual responses about the attitude object; the affective component refers to an individual’s feelings, moods, emotional responses, or gut reactions engendered by the attitude of an object; the behavioral component refers to an individual’s evaluations of the attitude of an object based on their past behaviors (Hong et al., 2011; Bizer, 2004; Piderit, 2000; Breckler, 1984). These three components are hypothetical and unobservable constructs and are represented by observable measures (Breckler, 1984). A person may be addicted to online games (behavior) and may think that playing online game is enjoyable (affective) but may also think that online game takes him/her too much time and money.

The tripartite model of attitude provides researchers a further understanding of IS adoption (Hong et al., 2011). Hong et al. (2011) has adopted tripartite model of attitude to investigate users’ attitude of agile IS. According to Hong et al. (2011)’s definition, agile is characterized by frequent upgrades with a small number of new features released such as iPhone apps and web-based systems. Since mobile banking includes smart phone apps and Internet banking (have to be conducted via mobile devices), mobile banking can be viewed as an agile IS. Thus, the tripartite model of attitude fits the context of mobile banking.

Status Quo Bias and Omission Bias

Samuelson and Zeckhauser (1988) argued that status quo bias is the behavior that humans have a tendency to prefer options that cause no change to the state of the world. Status quo bias increases people’s intention to resist any change. That is, people prefer to stay the way they are rather than altering their behavior. It is assumed that people would prefer keep using Internet banking on PCs or going to the bank counter in person even they know mobile banking are more convenient and effort-saving. Another theory named omission bias that refers to humans’ tendency to require no action on their part (Ritov & Baron, 1992). This means that the few efforts needed the more preference people will have in using mobile banking. These efforts may include learning how to use mobile banking and altering their old way to access banking services.
Innovation Attributes in M-banking

In innovation diffusion theory, Rogers (1995) proposes a set of innovation attributes that may affect adoption decisions. This set of innovation attributes contains five attributes: relative advantage, compatibility, complexity, trialability and observability. In the context of Internet-based technology adoption, relative advantage, compatibility and complexity are found to be the most frequently identified factors (Papies & Clement, 2008; Vijayasarathy, 2004). Laukkanen (2007) recognizes mobile banking as a technological innovation because of the ubiquity, ease of use and fast of speed that mobile banking has. Innovation attributes were found to be vital drivers in the context of mobile banking by researchers (Lin, 2011; Chen, 2013).

Because the mobile banking application is a new banking service, different benefits may be expected from switching from an existing one to a new one. The benefits that mobile banking provides to users may include productivity gains, better access to information, and better information quality available. Relative advantage plays an important role in switching since there will be no reason to switch to a new IT if it does not have some incremental benefit over the old IT (Bhattacherjee et al., 2012). Furthermore, customers are more likely to generate positive attitude toward adopting mobile banking when they perceive clear relative advantages offered by mobile banking (Lin, 2011).

Tsai et al. (2010) pointed out that complexity is a good predictor when evaluating the changes that a technological innovation could bring. The predictability of complexity toward attitude is supported in the context of mobile banking (Chen, 2013). The compatibility of a new IT services has been proved that it has a positive effect on attitudes towards adoption (Mallat et al., 2004). Compatibility was also found to have strong positive effect toward users’ intention to adopt mobile banking (Hanafizadeh et al., 2014; Koenig-Lewis et al., 2010; Wessels & Drennan, 2010).

Switching Cost in M-banking

The concept of switching costs has often been adopted in many researches to investigate the idea of losing existing benefits or incurred extra efforts when accepting a new product or services (Burnham et al., 2003). Switching cost plays an important operational measurement that is monitored regularly by service providers in e-banking environment (Huang & Hsieh, 2012). Switching cost could be an inhibitor of user behavior, and more studies related to their relationship were expected (Zhou, 2012b; Zhou, 2011).

Among the plenty literature, Burnham et al. (2003) proposed a clear concept of switching costs and identifies eight facts for switching cost: 1) economic risk cost; 2) evaluation cost; 3) learning cost; 4) setup cost; 5) benefit loss cost; 6) monetary loss cost; 7) personal relationship loss cost, and 8) brand relationship loss cost. Nevertheless, Burnham et al. (2003) also classified these eight facts into three categories named: 1) procedural switching cost, 2) financial switching cost, and 3) relational switching costs. The procedural switching costs consider the time a customer spends. Procedural switching costs contain economic risk costs, evaluation costs, setup costs and learning costs. The financial switching costs refer to the monetary aspect for the customer. Financial switching costs contain benefit loss costs and monetary loss costs. The relational switching costs pertain to the emotional aspects of the customer. Relational switching costs contain personal relationship loss costs and brand relationship loss costs.

To adopt mobile banking, individuals may have to spend more efforts and costs. These costs include extra communication fees and transaction fees due to the mobile network usage. Perceived financial cost was found to be a significant barrier for users to adopt mobile banking (Luarn & Lin, 2005). Ha et al. (2012) indicate that further research on the impact of indirect costs in mobile banking literature is required. Base on status quo bias and omission bias, this study investigates the concept of cost via switching cost.
Personal Innovativeness in M-banking

Nelson (1990) emphasized that individual difference is an important variable in new technology acceptance. High innovative people are active information seekers about new ideas (Tariq, 2007). In another word, innovative people are more likely to accept new IT and try to use it. Moreover, in marketing, research suggests that a user population faced with common incumbent and substitute technologies may exhibit differential patterns of switching based on individual differences. Personal innovativeness appeared to be the most important one (Bhattacherjee et al., 2012) and can explain why some people are early innovators while others are laggards in adopting new IT. Luo et al. (2010) recognizes personal trait factors as the major levers that override the effect of perceived risks and directly influence the intention to adopt mobile banking. Zhou (2012a) also indicated that user motivations such as personal involvement might affect initial trust building and could become indirect factors toward users’ adoption of mobile banking.

Since the predictability of personal innovativeness on flow experience was found to be significant (Zhou, 2012b) and one of the characteristics of flow experience was intrinsic enjoyment (Novak et al., 2000), it is reasonable to conclude that personal innovativeness has emotional effects toward people’s evaluation. Moreover, personal innovativeness revealed people’s natural propensity toward a new thing that is parallel to the gut reaction mentioned in the definition of affective component. Thus, this study adopted personal innovativeness as the factor of affective attitude.

Habit

Habit could be referred as a phenomenon that IT users who have been using a certain technology for some time are predisposed to continue using it in an automatic and unknowing manner (Limayem et al., 2007). For some unknowing reasons, people prefer to stay the way they used to be. These reasons might be status quo bias or omission bias or even something else. Bhattacherjee et al. (2012) argued that there’re effects between habit and IT switching behavior. Obviously, habit is an effect that prevents people from accepting new things. People are less likely to switch to a new IT because of their habit (Bhattacherjee et al., 2012). The results of Limayem et al. (2007)’s research also showed that people who have habit in using certain IT are less likely to switch to a new IT.
HYPOTHESES/MODEL

Prior study (Breckler, 1984) adopted the three-component view of attitude to analyze the tripartite model and identify appropriate variables and represent these three components by observable measures.

Cognitive Component

Relative advantage is referred to the extent to which mobile banking is perceived as being beneficial over the preceding banking services (Bhattacherjee et al., 2012). Because mobile banking can be viewed as a new banking service channel, additional benefits are expected. The benefits may include productivity gains, better access to information, and better information quality available. Relative advantage plays an important role in switching since there would be no reason to switch to a new IT if the new IT did not have any incremental benefit over the old IT (Bhattacherjee et al., 2012). The relationship between relative advantage and intention are found to be positive in prior researches. Thus, this study proposed the following hypothesis:

H1: Relative advantage is positively correlated with consumer’s intention to use mobile banking

Complexity is referred as the degree to which mobile banking is perceived as relatively difficult to understand and use (Tsai et al., 2010; Bhattacherjee et al., 2012). Tsai et al. (2010) pointed out that complexity is a good predictor when evaluating the changes that a technology innovation could bring. The predictability of complexity toward consumer's intention is supported in the context of mobile banking (Tsai et al., 2010). This means that if people find the use of mobile banking more complexity than the way they used to access banking service, their intention to use mobile banking will be lower. Thus, this study proposed the following hypothesis:

H2: Complexity is negatively correlated with consumer’s intention to use mobile banking

In this study, switching cost refers to the one-time perceived loss and transition cost a user would incur in the process switching from current banking channel to mobile banking (Polites & Karahanna, 2012; Hong et al., 2011; Kim et al., 2009; Burnham et al., 2003). The concept of switching cost is broad including financial aspect, procedural aspect, and relational aspect (Burnham et al., 2003). Furthermore, switching cost is an inhibitor of user behavior and plays as a barrier of users’ adoption of a new IT (Zhou, 2012a; Luarn & Lin, 2005). When an individual adopts mobile banking, the individual may need to spend extra efforts to get used to it and additional costs may be needed. Switching cost of adopting mobile banking may include financial cost such as purchasing a mobile device or paying mobile network fee, relational cost such as losing a clerk who is familiar with your special needs, and procedural cost such as spending time and efforts getting used to it. Thus, this study proposed the following hypotheses:

H3: Switching cost is negatively correlated with consumer’s intention to use mobile banking

Affective Component

In elaboration likelihood model, when an individual has no ability or motivation to face a complex situation, he or she will tend to rely on the peripheral route to assist him or her to make the decision. Sometimes the reliance on affection and emotion is a quicker, easier, and more efficient way to deal with changing environment (Chaiken & Trope, 1999). Thus, the investigation on affective component of attitude is essential. In this study, effective component refers to an individual’s feelings, moods, emotional responses, or gut reactions engendered by mobile banking (Hong et al., 2011; Bizer, 2004; Piderit, 2000; Breckler, 1984).
The definition of personal innovativeness is the propensity and inclination of an individual to try out or experiment with any new information systems (Bhattacherjee et al., 2012). Tariq (2007) argued that high innovative people are active information seekers about new ideas. In another word, people with more innovativeness are more likely to accept new IT and try to use it. Personal innovativeness appeared to be the most important factor to explain why some people are early innovators while others are laggards in adopting new IT (Bhattacherjee et al., 2012). This study proposed the 4th hypothesis as below.

H4: Personal innovativeness is positively correlated with consumer’s intention to use mobile banking.

**Past Behavior Component**

Behavior is the third component in the tripartite model of attitude. According to status quo bias, people are usually reluctant to change. Bizer (2004) also argued behavior refers to how a person has acted in the past or would act in the future. Compatibility of a new IT services has been proved to have a positive effect on consumer’s intention (Lu et al., 2011; Schierz et al., 2010) in the context of E-commerce and mobile payment. The more compatible an individual perceived, the less efforts needed for the changing and the less influential status quo bias can be. Compatibility replies the consistence between adopting mobile banking and an individual’s current behavioral patterns. Compatibility in this study is referred as the extent to which using mobile banking is viewed as being compatible with user’s current or future needs, lifestyles and work patterns (Bhattacherjee et al., 2012). Thus, the following hypothesis was proposed:

H5: Compatibility is positively correlated with consumer’s intention to use mobile banking.

Status quo bias argues that people prefer no change against current situation. People may evaluate a new IT based on their past behavior. Since habit is referred as a phenomenon that IT users who have been using a certain technology for a period of time are predisposed to continue using it in an automatic and unknowing manner (Limayem et al., 2007). That is, the habit a person has will somehow influence his or her preference on the new IT. Limayem et al. (2007) concluded that people who have habit in using certain IT are less likely to switch to a new IT. Also, habit is found to have positive effect on people’s intention to adopt a new IT (Venkatesh et al., 2012; Hong et al., 2011). Thus, this study adopted habit as the factor in past behavior component of attitude. And the following hypothesis was proposed:

H6: Habit is negatively correlated with consumer’s intention to use mobile banking.

Thus, this study identifies relevant variables for each component in order to determine attitude. There are three components to determine the attitude, and they are cognitive component, affective component, and past behavior component. In this study, the variables of cognitive component are relative advantage, complexity, and switching cost; the variables of affective component is personal innovativeness; the variables of past behavioral component are compatibility and habit. Figure 1 illustrates the initial research framework of this study.
METHODS

Instrument Development

To develop the multi-item measures for each construct, this study reviewed the literature regarding IT adoption and mobile commerce, especially mobile banking, and collected the items they used. All constructs were measured using existing validated scales from prior literatures (see Table 1). After that, redundant items with similar wording were deleted. The rest items were translated into Chinese from English and were slightly adapted to fit the specific context of mobile banking.

Expert Panels and Pilot Test

After developing the instrument, the expert panels were held to validate the initial questionnaire and the initial research framework. The expert panel consisted of one associate professor and one assistant professor who were specialized in information management in academic researches, and one professional who was a vice general manager specializing in information management in financial industry. The experts validated the initial research framework for mobile banking context and the appropriateness of measurement.

After the expert panel, the revised instrument has been tested by a pilot study. The pilot study recruited Master degree students in Institute of Information Management at a university in Northern Taiwan. Some modifications were made based on the feedback of pilot study such as noting the explanation of non-mobile online banking at the end of item statement to ensure respondents’ comprehension. Some items’ wording was modified to fit the specific context of mobile banking usage. All items were measured by seven-point Likert scale. The working definitions of all variables in this study are exhibited in Table 1 below. None of the Cronbach’s α of each scale of the measurement was lower than the cut-off value 0.7. Two items with factor loadings lower than 0.5 were dropped from the scale. Another two items were removed based
on the result of pilot test and expert panel, that is, they had the same opinion about these two could be removed from the measurement.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Working Definition</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Advantage</td>
<td>Relative advantage is referred to the extent to which mobile banking is perceived as being beneficial over the preceding banking services</td>
<td>Rogers, 1995; Bhattacherjee et al., 2012</td>
</tr>
<tr>
<td>Complexity</td>
<td>The degree to which mobile banking is perceived as relatively difficult to understand and use</td>
<td>Rogers, 1995; Bhattacherjee et al., 2012; Tsai et al., 2010</td>
</tr>
<tr>
<td>Switching Costs</td>
<td>The one-time perceived loss and extra cost a user would incur in the process switching from current banking channel to mobile banking</td>
<td>Polites &amp; Karahanna, 2012; Hong et al., 2011; Kim et al., 2009; Burnham et al., 2003;</td>
</tr>
<tr>
<td>Personal Innovativenesses</td>
<td>The propensity and inclination of an individual to try out or experiment with any new information systems</td>
<td>Bhattacherjee et al., 2012; Crespo &amp; del Bosque, 2008; Tariq, 2007</td>
</tr>
<tr>
<td>Compatibility</td>
<td>The extent to which using mobile banking is viewed as being compatible with user’s current or future needs, lifestyles and work patterns</td>
<td>Rogers, 1995; Bhattacherjee et al., 2012</td>
</tr>
<tr>
<td>Habit</td>
<td>The extent to which using the preceding banking service, except for mobile banking, has become automatic for an individual in response to banking activities</td>
<td>Limayem et al., 2007</td>
</tr>
<tr>
<td>Intention to adopt mobile banking</td>
<td>The degree to which a person perceives his/her willingness to use mobile banking</td>
<td>Yu, 2012</td>
</tr>
</tbody>
</table>

Data Collection

The subjects of formal survey procedure were undergraduate students and graduate students, with two conditions: 1) own at least one smart phone and; 2) own at least one active bank account. For undergraduate students and graduate students are considered as the potential mobile banking users in previous studies (Zhou, 2012a; Luo et al., 2010). To ensure that the respondents possess the abilities to become future users of mobile banking, the respondents must be available to access banking services and equipped with necessary mobile technology infrastructure. The data was collected during the period from May 26th to June 9th in 2014. A total of 300 questionnaires were distributed and 276 data were collected. 262 valid data were collected.

RESULTS

Demographic Data of Respondents
Among the 262 respondents, 50.4% were male and 49.6% were female. The age range of the respondents was mainly distributed from 20 to 24 years old (60.3%). 62.2% of the respondents were graduate students and 21.4% of the respondents were graduate degree program students. For monthly income, 31.7% of the respondents had no any income, 42.4% of the respondents had less than 20,000 NTD, and 11.5% of the respondents had their monthly income ranged from 40,001 to 70,000 NTD. Among all the respondents, 66.8% of them never used mobile banking before. For those who have mobile banking usage experience, only 27.6% of them use mobile banking at least once per week being recognized as regular users, 10.3% of them use mobile banking about once every two weeks being recognized as occasional users, and there were 62.1% of them use mobile banking about once or even less per month being recognized as rare users. All the descriptive statistics of respondents were listed in Table 2.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Categories</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>Male</td>
<td>132</td>
<td>50.4</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>130</td>
<td>49.6</td>
</tr>
<tr>
<td>Age</td>
<td>&lt; 20</td>
<td>11</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>20-24</td>
<td>158</td>
<td>60.3</td>
</tr>
<tr>
<td></td>
<td>25-29</td>
<td>42</td>
<td>16.0</td>
</tr>
<tr>
<td></td>
<td>30-34</td>
<td>19</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>35-39</td>
<td>12</td>
<td>4.6</td>
</tr>
<tr>
<td></td>
<td>40-44</td>
<td>14</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>45-49</td>
<td>3</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>50-54</td>
<td>3</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td>Undergraduate Student</td>
<td>35</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>Graduate Student</td>
<td>163</td>
<td>62.2</td>
</tr>
<tr>
<td></td>
<td>Ph.D. Student</td>
<td>5</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>Graduate Degree Program Student</td>
<td>56</td>
<td>21.4</td>
</tr>
<tr>
<td></td>
<td>Ph.D. Degree Program Student</td>
<td>3</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Monthly Income (NTD)</strong></td>
<td>None</td>
<td>83</td>
<td>31.7</td>
</tr>
<tr>
<td></td>
<td>1-20,000</td>
<td>111</td>
<td>42.4</td>
</tr>
<tr>
<td></td>
<td>20,001-40,000</td>
<td>14</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>40,001-70,000</td>
<td>30</td>
<td>11.5</td>
</tr>
<tr>
<td></td>
<td>70,001-100,000</td>
<td>19</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>&gt;100,000</td>
<td>5</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>M-banking Experience</strong></td>
<td>None</td>
<td>175</td>
<td>66.8</td>
</tr>
<tr>
<td></td>
<td>Have Used It Before</td>
<td>87</td>
<td>33.2</td>
</tr>
<tr>
<td><strong>M-banking Usage</strong></td>
<td>Use It Everyday</td>
<td>4</td>
<td>4.6</td>
</tr>
</tbody>
</table>
Exploratory Factor Analysis and Confirmatory Factor Analysis

To test construct validity, factor analysis, such as exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), is a common used methodology (Gefen & Straub, 2005). Kaiser-Meyer-Olkin (KMO) and Bartlett test of sphericity were conducted to ensure the data collected were appropriate for EFA. The principal component factor analysis and the Varimax rotation were conducted. The suggested criteria of extracting factors are eigenvalue greater than 1.0 and no factor loading less than 0.5. In the first round of EFA, we found that 3 items (PI1, HA4, and HA5) had its factor loading less than 0.5 and therefore we removed them from the instrument. After removing these three items, EFA was conducted again. In the second EFA process, a total of seven constructs were extracted, all the items were loaded on the construct as hypothesized, and no factor loading were less than 0.5 (See Table 3). The above results imply that there is sufficient construct validity of the items. There is a total of three scales of Cronbach’s α above 0.9, three scales of Cronbach’s α are above 0.8, and 1 scale of Cronbach’s α is above 0.6. Thus, all the constructs of this study can be considered to be reliable (see Table 3). Except for Cronbach’s α, composite reliability (CR) was another common measure of reliability. It is considered acceptable to have the value above 0.7, whereas a value below 0.6 indicates a lack of reliability. There’s one scale of CR in this study above 0.9, five scales of CR above 0.8 indicating that all the constructs in this study have enough reliability. However, there’s one scale of CR nearly reached the recommended value of 0.6. The value of AVE of six constructs are higher than 0.5. Only one construct fails to pass the recommended value of CR and AVE but other results of convergent validity tests of this construct are still qualified. As a result, this study recognized construct “switching cost” as lack of high convergent validity but still considerable. The above results indicate that all the constructs in this study are considered to have convergent validity.

The correlations between latent variables of this study are illustrated in Table 4 and the values in diagonal line are replaced by the square root of AVE of each construct. All the correlation coefficients among dimensions in this study are lower than 0.85. The square root of each construct is higher than its correlations between other constructs except for relative advantage and intention, complexity and switching cost, switching cost and intention, complexity and intention.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Factor Loading</th>
<th>Cronbach’s α</th>
<th>CR</th>
<th>AVE</th>
<th>Squired Multiple Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Advantage</td>
<td>RA1</td>
<td>0.800</td>
<td></td>
<td>0.824</td>
<td>0.5409</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>RA2</td>
<td>0.820</td>
<td></td>
<td>0.824</td>
<td>0.5409</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>RA3</td>
<td>0.687</td>
<td></td>
<td></td>
<td></td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>RA4</td>
<td>0.716</td>
<td></td>
<td></td>
<td></td>
<td>0.39</td>
</tr>
<tr>
<td>Complexity</td>
<td>CX1</td>
<td>0.857</td>
<td></td>
<td>0.886</td>
<td>0.5554</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>CX2</td>
<td>0.868</td>
<td></td>
<td>0.886</td>
<td>0.5554</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>CX3</td>
<td>0.846</td>
<td></td>
<td></td>
<td></td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>CX4</td>
<td>0.704</td>
<td></td>
<td></td>
<td></td>
<td>0.52</td>
</tr>
</tbody>
</table>
Hypothetical Testing

We examined the structural model using LISREL 8.7. The results of testing the structural model are shown in Figure 2.
Four out of six hypotheses in this study are supported. The results indicate that relative advantage ($H_1$, $t$-value=4.43, $p<0.001$, $\beta=0.31$), personal innovativeness ($H_4$, $t$-value=4.88, $p<0.001$, $\beta=0.22$), and compatibility ($H_6$, $t$-value=5.45, $p<0.001$, $\beta=0.33$) have significant positive effect on consumers' intention. And switching cost ($H_4$, $t$-value=-2.30, $p<0.05$, $\beta=-0.30$) has significant negative effect on consumers' intention. These four variables explain 59 percent of variance of attitude, supporting $H_1$, $H_3$, $H_4$, and $H_5$. However, complexity ($H_2$) and habit ($H_6$) have no significant negative effects on consumers' intention to use mobile banking.

**DISCUSSION AND CONCLUSIONS**

There are three main findings from this study. First, the tripartite model of attitude is empirically validated by the data collected with cognitive variables of relative advantage and switching cost, affective variable of personal innovativeness, and past behavior variables of compatibility. This study integrated innovation attributes, switching cost, and personal innovativeness into the tripartite model of attitude to investigate consumers' intention to adoption of mobile banking. Second, the role of personal innovativeness in the context of mobile banking is established empirically. This study shows personal innovativeness as the predictor of consumer's intention. Third, relative advantage and compatibility factor show the same relationship to intention to mobile banking as previous studies (Chen, 2013; Yang et al., 2012; Mallat et al., 2009).

**REFERENCES**


