

Understanding and Predicting Behavioral Intention to Adopt Mobile Banking: The Korean Experience

Ilyoo Barry Hong, Chung-Ang University, Seoul, Republic of Korea

ABSTRACT

Although mobile banking provides cost-saving opportunities as well as convenient banking experience for customers, today's banks still face challenges when deploying the technology because a good number of customers are reluctant to use mobile banking for personal reasons. This article is an empirical investigation of the determinants of the intention to use mobile banking services. The determinants are grouped into two categories including personal factors and social influence factors. The authors conducted an empirical analysis using 751 survey responses collected from present users of mobile banking services. The results of the analysis reveal that all the personal factors have positive relationships with the intention to use mobile banking services. On the other hand, it was found that of the social influence factors, perceived herding behavior has a significantly positive relationship with the intention to use mobile banking services, whereas subjective norm is not significantly related to the intention. The authors provide practical as well as academic implications of the research findings.

KEYWORDS

Herding Behavior, Mobile Banking, Online Banking, Subjective Norm, Technology Acceptance

1. INTRODUCTION

Today Internet is considered a key enabler of innovation of bank operations by transforming the way banking services are provided. Especially in recent years, the widespread use of smartphones is accelerating the increase of mobile banking transactions. According to a recent report by Juniper Research (2018), over two billion users will access retail banking services via smartphones, tablets, PCs and smartwatches in 2018. A smartphone makes it easy for a consumer to perform online banking while on the go, and thus mobile banking is increasingly becoming a more attractive mode of banking transaction.

Along with this trend, banks are adopting a strategy to lead their customers to shift from offline to online banking, thereby achieving significant improvement in operational efficiency. However, there still are a host of bank customers who are reluctant to use online banking system for their day-to-day transactions due to either perceived risk or lack of ease of use (Kuisma, Laukkanen, & Hiltunen, 2007; Lee, 2009). Today banks are pressured to provide convenient banking services for

DOI: 10.4018/JGIM.2019070110

This article, originally published under IGI Global's copyright on April 5, 2019 will proceed with publication as an Open Access article starting on January 13, 2021 in the gold Open Access journal, Journal of Global Information Management (converted to gold Open Access January 1, 2021), and will be distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and production in any medium, provided the author of the original work and original publication source are properly credited.

customers and further improve financial conditions via cost savings by increasing the proportion of online transactions. In this regard, we need research that identifies factors influencing the intention to accept mobile banking services based on smartphone technology. While there are several studies examining the antecedents of the intention to accept mobile banking, they are mostly based on traditional technology acceptance models, such as theory of reasoned action, theory of planned behavior, and technology acceptance model (Venkatesh, Morris, Davis, & Davis, 2003).

In particular, in collectivist-oriented cultures like Korea, social pressures like perceived herd behavior may have strong impact on an individual's intention to accept a new information technology. Nevertheless, little research effort has been dedicated to uncovering the impact of such social influence factors systematically, while there are a few studies that examined the role of subjective norm. Some studies that empirically investigated IT acceptance, including Venkatesh et al. (2003), have introduced a broad research construct called social influence. However, this construct is conceptually close to subjective norm included in TRA and TPB models. Research endeavors are needed to understand what effects social as well as personal dimensions have on a banking customer's intention to accept and use mobile banking.

Hence, this study aims at integrating not only traditional technology acceptance theories but also social influence theories including information cascades theory, social cognitive theory, and innovation diffusion theory to propose a comprehensive model of predicting the intention to accept smartphone-banking services from the perspective of personal and social influence dimensions. To this end, we will review the related literature to draw on the antecedents of the intent to accept mobile banking, use the antecedents to build a conceptual model of mobile banking acceptance, and empirically validate the model. The rest of the paper is comprised of the following. The second section provides a theoretical background. The third section presents a research model and hypotheses along with the measures. It is followed by the fourth section that presents the data collection method and the results of data analysis. Finally, the fifth section offers implications, limitations and future research directions. This research makes contributions by identifying factors influencing the intention to accept mobile banking and offering implications useful for developing strategies designed to increase the proportion of online banking transactions.

2. RELATED LITERATURE

Mobile banking research has its roots in the studies related to online banking based on Internet. Numerous studies have examined the factors that influence the adoption of online banking. A majority of these studies present the results of empirical analysis concerning the acceptance of online banking based on technology acceptance theories. Accordingly, we will first review key technology acceptance theories, and introduce recent trends in mobile banking research.

2.1. Theories of Technology Acceptance

Researchers have concentrated on uncovering the factors that affect the intention to accept a new information technology from the perspective of behavioral science. Examples of major theories and models in this domain include the theory of reasoned action (Fishbein & Ajzen, 1975), the theory of planned behavior (Ajzen, 1985), the innovation diffusion theory (Rogers, 1995), the social cognitive theory (Compeau & Higgins, 1995), and the technology acceptance model (Davis, 1989). These are designed to identify the drivers of the acceptance of new information technology from various theoretical perspectives. Venkatesh et al. (2000) combined 8 related theories and proposed the unified theory of acceptance and usage of technology (UTAUT). In this research, we introduce TRA, TPB, IDT, SCT and TAM that form the theoretical basis of our research model.

First, the theory of reasoned action (TRA) is designed to understand and predict the human behavior and to explain the relationships among beliefs, attitude and behavior (Fishbein & Ajzen, 1975). This theory postulates that the actual behavior is affected by behavioral intention, and the

behavioral intention is determined by both the attitude toward the behavior and the subjective norm about the behavior. An individual's attitude consists of beliefs about the evaluation of the outcomes of performing the behavior. Subjective norm is the expectations that important others have of the individual concerning the behavior, and it indicates one's beliefs about social pressures posed by his or her acquaintances (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975).

Secondly, the theory of planned behavior (TPB) has been developed by Ajzen (1985) and Ajzen and Madden (1986) who added a new construct called perceived behavioral control to overcome limitations of TRA. It argues that the behavioral intention is affected by perceived behavioral control as well as attitude and subjective norm (Ajzen & Madden, 1986). Perceived behavioral control will play a larger role than behavioral intention in predicting the behavior especially when an individual does not have volitional control over the behavior (Ajzen, 1991).

Thirdly, the innovation diffusion theory (IDT) focuses on explaining how a new idea or technology gains momentum and spreads through cultures. Rogers who first created the theory argues that diffusion is the process by which an innovation is communicated through certain channels over time among the participants in a social system (Rogers, 1995). According to the IDT, diffusion occurs through the five-stage decision-making process: knowledge, persuasion, decision, implementation, and confirmation (Rogers, 1995; Zaltman, Duncan, & Holbek, 1973). First, an individual is exposed to an innovation (knowledge stage); he is interested and seeks related information (persuasion stage); he evaluates the innovation and either adopts or rejects the innovation (decision stage); he employs the innovation for his needs (implementation stage); and he finalizes the decision to continue using the innovation (confirmation stage). Rogers (1995) classifies adopters into five categories including innovators, early adopters, early majority, late majority, and laggards. Agarwal and Prasad (1998) empirically proved that personal innovativeness is directly affected by the type of adopters.

Fourth, the social cognitive theory (SCT) is based on the idea that an individual can learn from observations of others within the context of social interactions (Bandura, 1986). The theory states that when people observe a model performing a behavior and the consequences of that behavior, they remember the sequence of events and use this information to guide subsequent behaviors. Observing a model can also prompt the viewer to engage in the behavior they already learned (Bandura, 1986). Bandura (1986) argued that human behavior is caused by three categories of influences: cognitive (knowledge, expectations, and attitudes), behavioral (skills, practice, and self-efficacy), and environmental (social norms, access in the community, influence on others). Bandura termed these influences of forces reciprocal determinism. The SCT postulates that learning will most likely occur if there is a close identification between the observer and the model and if the observer has much self-efficacy. Self-efficacy is the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations (Bandura, 1995). In the SCT, self-efficacy plays a central role in the performance of behavior by affecting the way an individual approaches and achieves goals, tasks and challenges.

Fifth, the technology acceptance model (TAM) was first proposed by Davis (1986) to predict adoption and use of information technology. The TAM links behaviors to attitudes and beliefs to make sound predictions of system usage (Wixom & Todd, 2005). In this model, two constructs are incorporated as antecedents of attitude toward adoption of a new technology: perceived usefulness and perceived ease of use. Perceived usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). On the other hand, perceived ease of use is "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989). These two constructs tend to be influenced by external variables including information quality and system quality.

Finally, the unified theory of acceptance and use of technology (UTAUT) is a theory that can explain up to 70% of the variance in behavioral intention to use an information system and about 50% in actual use (Sykes, Venkatesh, & Gosain, 2009). It was originally theorized by Venkatesh et al. (2003) by combining related theories of technology acceptance. Integrated into

the model are TRA, TAM, TPB, motivational model, model of personal computer use, IDT, and SCT. The UTAUT posits that four key constructs of the model are performance expectancy, effort expectancy, social influence, and facilitating conditions and that the first three are direct determinants of usage intention and behavior while the fourth is a direct determinant of use behavior (Martins, Oliveira, & Popovič, 2014).

2.2. Mobile Banking

From the perspective of a banking customer, mobile banking and Internet banking are both online banking. Early research on online banking has concentrated on Internet-based banking services used with desktop or laptop computers. Related studies focused on identifying and testing factors that influence the intention to adopt Internet banking based on theories of technology acceptance.

Over the past few years, online banking research has evolved as the interest in mobile banking grew with the widespread use of smartphones and other mobile devices. The mobile phone as a channel for service consumption offers enormous potential in addition to the benefits provided by Internet banking (Laukkanen, 2007). For this reason, a large proportion of studies on mobile banking adoption are rooted in the research on Internet banking adoption. For example, such studies as Martins et al. (2014) and Lee (2009) focused on exploring factors influencing the consumer's adoption of online banking based on one or more theories of technology acceptance (Table 1).

Nevertheless, mobile banking adoption should be distinguished from Internet banking adoption in that use of mobile banking is in large part influenced by the society-wide trend associated with smartphone use. While the use of Internet banking is driven by the economic benefits (e.g., the ability to overcome time and space barriers), the use of mobile banking is motivated by social as well as personal factors. For example, pervasive use of smartphones in a society may drive an existing Internet banking user to switch to the mobile platform.

Table 1 shows how related studies investigated the factors that affected the adoption of mobile banking. Unfortunately, the existing studies on mobile banking have devoted little attention to the impact of social influences. Thus, the present research focuses on closing this deficiency found in the related studies.

Table 1. Theories of technology acceptance employed in mobile banking studies

Studies	TRA	TPB	IDT	SCT	TAM	UTAUT
Liao et al (1999)		○	○			
Tan and Teo (2000)		○	○			
Sathye (1999)					○	
Lederer et al. (2000)					○	
Liao & Cheung (2002)					○	
Luarn & Lin (2005)		○		○	○	
Al-Jabri and Sohail (2012)			○			
Dineshwar and Steven (2013)			○		○	
Yu (2012)						○
Oliveira et al. (2014)						○
Baptista and Oliveira (2015)						○

Note: TRA: theory of reasoned action; TPB: theory of planned behavior; IDT: innovation diffusion theory; SCT: social cognitive theory; TAM: technology acceptance model; UTAUT: unified theory of acceptance and use of technology

3. RESEARCH DESIGN

3.1. The Research Model

The purpose of this research is to identify the factors to predict the behavioral intention to adopt and use mobile banking. As we noted in the Literature Review, the extant research related to the adoption of a technology has centered on such theoretical models as TRA, TPB, and TAM. However, the present study aims at examining the impact of both personal and social influence factors upon mobile banking adoption. And to accomplish the research objectives, we will propose an integrative model using TPB, TAM, information cascades theory, SCT, and IDT. The research model takes into consideration both personal factors (e.g., perceived usefulness, perceived ease of use, and perceived security) and social influence factors (e.g., information cascades, self-efficacy, and personal innovativeness), and aims at helping to understand how these two groups of factors contribute to the behavioral intention to adopt mobile banking.

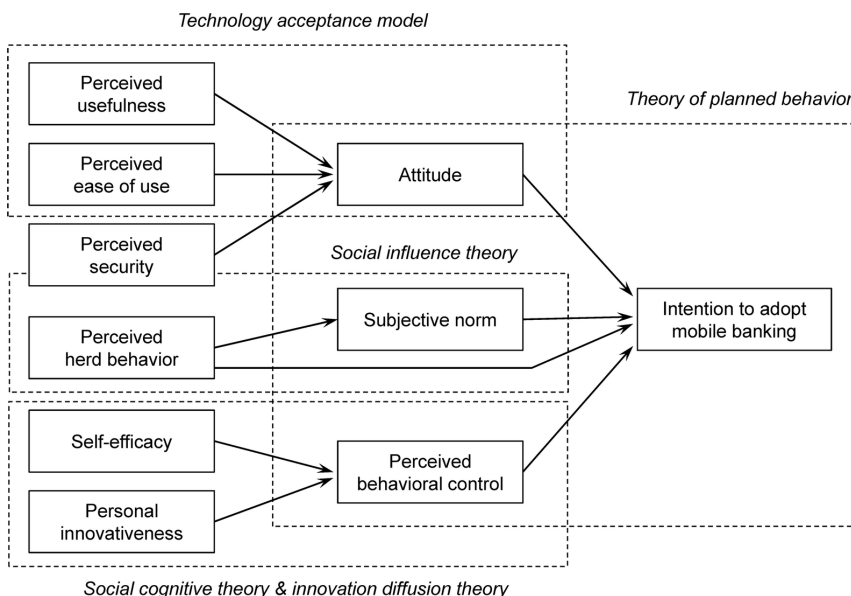
Figure 1 shows the proposed research model. As TPB posits, the intention to adopt and use mobile banking is influenced by attitude, subjective norm, and perceived behavioral control. In addition, we added perceived herd behavior as an antecedent to both adoption intention and subjective norm, based on the social influence theory. The social influence theory states that the bandwagon effect that occurs as a result of observing herd behavior is likely to affect a user's adoption of a technology.

Meanwhile, we used the TAM to predict that attitude toward the adoption behavior is influenced by three attitudinal beliefs including perceived usefulness, perceived ease of use, and perceived security. In addition, the social influence theory was employed to postulate that perceived herd behavior is an antecedent of subjective norm. And the social learning theory was used to suggest that self-efficacy is a determinant of perceived behavioral control. Finally, the innovation diffusion theory was applied to establish personal innovativeness as a factor influencing perceived behavioral control.

3.2. Research Hypotheses

Perceived usefulness, a key antecedent of attitude in the TAM, is defined as “the extent to which a potential user thinks the use of information technology will improve his or her job performance

Figure 1. The research model



(Davis, Bagozzi, & Warshaw, 1989). The other antecedent of attitude is perceived ease of use that is defined as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989). It is concerned with how usable the system is. Prior studies found that perceived usefulness and perceived ease of use positively affect attitude about the use of Internet banking (Lee, 2009). Therefore, we formulate the following hypotheses concerning the effects of perceived usefulness and perceived ease of use on attitude:

H1: Perceived usefulness will positively affect attitude toward mobile banking adoption.

H2: Perceived ease of use will positively affect attitude toward mobile banking adoption.

Concerns over security and privacy threats are often a major barrier to the acceptance of online banking services (Dineshwar & Steven, 2013). Consumers are concerned that sensitive information that they provide when ordering, such as addresses, phone numbers, and even credit card numbers might be misused by vendors. Swaminathan et al. (1999) found that the greater the perceived security of transactions in an online medium, the greater the likelihood of online buying and selling. Security is among the key terms most frequently mentioned in studies related to Internet banking and mobile banking. Due to the high involvement included in banking transactions, security and privacy concerns are often major obstacles to Internet banking (Kuisma et al., 2007).

Overall, related studies on Internet banking agree that perceived security is a key determinant of users’ attitude toward use of an Internet banking system. Hence, we established a positive relationship between perceived security and attitude toward the adoption and use of mobile banking. Below is the hypothesis that we propose concerning the relationship:

H3: Perceived security will positively affect attitude toward mobile banking adoption.

Mobile banking is likely to involve a high degree of uncertainty resulting from either information asymmetry or information deficiency. Herd behavior has been recognized as a key subject in social science research. In particular, consumers’ herd behavior in business firms has been studied in such fields as stock transactions as well as firm’s IT adoptions (Bikhchandani, Hirshleifer, & Welch, 1998). Herd behavior in an online setting is directly related to network externalities. Network externalities are a special kind of externalities in which one individual’s utility for a good depends on the number of other people who consume the commodity.

Network externalities are the effects of a user of a product or service on others using the same or compatible products or services (Shapiro and Varian, 1999). The existence of positive network externalities is closely related to the bandwagon effect. The bandwagon effect is a phenomenon whereby the rate of uptake of beliefs, ideas, fads and trends increases the more that they have already been adopted by others (Colman, 2014). Herd behavior can be viewed as a consequence of the bandwagon effect. The bandwagon phenomenon occurs when an individual intends to infer information from the observed actions of others or to conform to their actions (Bikhchandani et al., 1998), and thus has a potential to give rise to herding. Herd behavior describes various social situations in which individuals are strongly influenced by the decisions of others (Asch, 1956). Herd behavior has been examined in various contexts of electronic commerce, including book purchasing (Chen, 2008) and software adoption (Duan, Gu, & Whinston, 2009). Herding is often associated with an information cascade that occurs when an individual follows the behavior of the preceding individual without regard to his own information under uncertainty (Bikhchandani et al., 1998). A consumer perceiving an intense herding phenomenon is likely to conform to the widely visible norm concerning mobile banking and thus increase the intention to adopt the mobile banking system. Hence we formulate the following hypothesis:

H4: Perceived herd behavior will positively affect subjective norm.

H9: Perceived herd behavior will positively affect adoption intention.

Psychologist Albert Bandura proposed self-efficacy as the most important precondition for behavioral change. Social cognitive theory which the concept originated from states that self-efficacy, also referred to as personal efficacy, is the extent or strength of one's belief in one's ability to succeed in specific situations or accomplish a task (Bandura, 1997). There exist studies that aimed at explaining a user's adoption of computer or Internet technologies using the self-efficacy concept (Compeau & Higgins, 1995; Eastin & LaRose, 2000). These studies conclude that computer self-efficacy is an important predictor of adoption or refusal of information technology. Luarn & Lin (2005) found that self-efficacy was a key factor influencing a user's behavioral intention to adopt mobile banking, while Tan & Teo (2000) reported that self-efficacy was positively correlated with Internet banking adoption. In addition, Igarria et al. (1995) found that self-efficacy had direct and indirect effects on perceived ease of use and on perceived usefulness for a PC user. Finally, Hasan (2006) also found an empirical evidence that self-efficacy was an important determinant of information system adoption. Overall, findings from numerous related studies support the positive relationship between self-efficacy and perceived behavioral control, a concept defined by Ajzen (1991) as people's perceptions of their ability to perform a given behavior. Thus, we propose the following hypothesis:

H5: Self-efficacy will positively affect perceived behavioral control.

How individuals respond to innovations has remained a central research issue in the IS literature. And personal innovativeness is a key concept in addressing this issue. In the domain of information technology, personal innovativeness refers to "the willingness of an individual to try out any new information technology" (Agarwal & Prasad, 1998). In this research, the construct is defined as the extent to which a user is willing to take some risk and try out mobile banking. Innovative consumers perceive less risk and are more open in handling innovations (Joseph & Vyas, 1984). Related studies including Davis (1989), Moore and Benbasat (1991), and Saga & Zmud (1994) report that personal innovativeness influence acceptance of an information technology. While innovative consumers would be quick to buy a new product, consumers classified as potential adopters delay acceptance decisions. In addition, innovative consumers are voluntary information seekers in search of new ideas, tend to face uncertainty or risks, and willingly try out a new product (Rogers, 1995). Then personal innovativeness would positively affect a consumer's beliefs about his or her ability to behaviorally control the adoption of mobile banking. Based on the above line of reasoning, we propose the following hypothesis:

H6: Personal innovativeness will positively affect perceived behavioral control.

The TAM model frequently used to theoretically explain the adoption of a technology has been developed by Davis (1989). It uses perceived usefulness and perceived ease of use as key variables that determine the acceptance of information technology, and assumes that an individual's intention to use a technology is influenced by its usefulness and the attitude toward the technology. The well-known TRA hypothesizes a positive relationship between attitude and behavioral intention (Fishbein & Ajzen, 1975). Attitude refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question (Ajzen, 1991). Behavioral intention is the cognitive representation of a person's readiness to perform the behavior (Lee & Hong, 2016). In the context of technology adoption, we can postulate that attitude is an important determinant of acceptance of mobile banking. Therefore, the following hypothesis is developed:

H7: Attitude toward adoption will positively affect adoption intention.

Human behavior is often affected by the beliefs that parents, teachers, friends, or others have concerning a certain behavior. The TRA postulates that subjective norms as well as attitudes are predictors of behavior intention. Subjective norm refers to the opinion of important others about a behavior. Ajzen (1991) defines subjective norm as the perceived social pressure to engage or not to engage in a behavior. When the theory is applied to the mobile banking situation, it is speculated that a user is likely to adopt the mobile banking system, provided that the user believes that mobile banking is useful and his acquaintances are positive about using mobile banking service. Therefore, we establish a positive relationship between subjective norm and intention to adopt mobile banking, and propose the following hypothesis:

H8: Subjective norm will positively affect adoption intention.

Perceived behavioral control is one of the central factors determining the behavioral intention in the TPB. It originates in the self-efficacy theory proposed by Bandura(1977). Perceived behavioral control is beliefs about how easy or how difficult performing a behavior is (Ajzen, 1985). Thus, perceived behavioral control is at times treated as a synonym with self-efficacy in the related literature. However, Conner & Armitage (1998) suggest that perceived behavioral control is divided into two parts including self-efficacy beliefs and perceived controllability over behavior, and self-efficacy encompasses the aspects of skills and ability. Related studies found that perceived behavioral control was a significant predictor of behavior in exercises, whereas self-efficacy was a significant determinant of academic achievement. As Ajzen & Madden(1986) state, perceived behavioral control reflects control beliefs – beliefs about facilitators and inhibitors affecting the behavior. As far as mobile banking is concerned, a consumer perceiving strong facilitators and weak inhibitors is likely to adopt the mobile banking service. The above theoretical grounds lead us to formulate the following hypothesis:

H10: Perceived behavioral control will positively affect adoption intention.

3.3. The Measures

We operationalized the variables under consideration. Operationalization is the process of defining a fuzzy concept so as to make it clearly distinguishable, measurable, and understandable in terms of empirical observations. The variables have been identified and operationalized based on related studies. All the items chosen to measure the individual variables have been adopted from these studies and then adapted to suit the objectives of the present research, thereby achieving content validity. The resulting measurement items have been put together to compose the questionnaire. The questionnaire consists of 40 questions, and employs a Likert-type 5-point scale for measurement. Table 2 summarizes variables, operational definitions, measurement items, and related sources.

4. DATA ANALYSIS

4.1. Research Method

This research employs an empirical analysis to test the research model and hypotheses. We use an online questionnaire to collect self-reported responses from the respondents. The questionnaire is composed of three parts. Part 1 includes questions concerning the way the respondent uses mobile banking. Part 2 focuses on inquiring about intention to adopt mobile banking. There are 40 questionnaire items in this part, including 4 items for perceived usefulness, 4 items for perceived ease of use, 4 items for perceived security, 5 items for perceived herd behavior, 4 items for self-efficacy, 4 items for personal

Table 2. The measures

Measure	Definition	Measuring Items	Sources
Perceived usefulness (PU)	The degree to which a person believes that using a mobile banking service would enhance his or her work performance	<ul style="list-style-type: none"> • Mobile banking improves the speed of work performance. • Mobile banking is necessary for bank transactions. • Mobile banking helps work performance. • Overall, mobile banking is useful in bank transactions. 	Venkatesh & Davis (2000); Suh & Han (2002)
Perceived ease of use (PEOU)	The degree to which a person believes that using a mobile service would be free from physical and mental effort	<ul style="list-style-type: none"> • It is easy for me to learn to use mobile banking • It is easy for me to perform necessary work using mobile banking • It is easy to understand and use the mobile banking menu • Using mobile banking is easy enough to complete banking transactions faster 	Venkatesh & Davis (2000); Suh & Han (2002)
Perceived security (PS)	The degree to which an individual believes that use of a mobile banking service would not involve security or privacy risk	<ul style="list-style-type: none"> • Security is good to the extent that my personal information (including resident id. no.) may not leak out online • Security is good to the extent that my financial information (including bank account balance, credit card no.) may not leak out online • Security is good to the extent that no one can use my financial information to conduct a transaction that leads to my financial loss • The overall security is superior to that on the previous system 	Tan & Teo (2000); Liao & Cheung (2002)
Herd behavior (HB)	Perceived social pressure to conform to the behaviors of others as a consequence of exposure to their behaviors	<ul style="list-style-type: none"> • Today it appears that mobile banking is being widely used. • My intent to use mobile banking seems to depend on how widely other people use such a service. • If I see others use mobile banking, I become inclined to use mobile banking too. • The more the number of mobile banking users appears to increase, the more likely I ought to jump on this bandwagon as a consequence. • When I decide on whether to adopt mobile banking, it is wise to follow the decision that other people around me make. 	Huang & Chen (2006)
Self-efficacy (SE)	The extent or strength of one's belief in one's own ability to utilize mobile banking	<ul style="list-style-type: none"> • I am confident in downloading and installing a mobile banking app on my smartphone. • I am able to conduct banking transactions (e.g., fund transfer) using mobile banking. • I am confident in basic operations of the smartphone device. • I am confident in most mobile banking transactions requiring a digital certificate. 	Luarn & Lin (2004); Hsu & Chiu (2004)
Personal innovativeness (PI)	The extent to which a user is willing to take some risk and try out mobile banking	<ul style="list-style-type: none"> • If I heard about a new information technology, I would look for ways to experiment with it. • Among my peers, I am usually the first to try out new information technologies. • In general, I am hesitant to try out new information technologies. • I like to experiment with new information technologies. 	Agarwal & Prasad (1998)
Attitude (AT)	The degree to which a person has a favorable or unfavorable evaluation or appraisal of mobile banking adoption	<ul style="list-style-type: none"> • I feel good about using mobile banking. • I feel positive about using mobile banking. • I feel favorable about using mobile banking. • It thinks it is wise to use mobile banking. 	Lee & Hong(2016)
Subjective norm (SN)	Perceived social pressure to comply with a behavior expected of a user by important referents	<ul style="list-style-type: none"> • My acquaintances would find it reasonable for me to use mobile banking. • My acquaintances would find it necessary for me to use mobile banking. • My acquaintances would find it worthwhile for me to use mobile banking. • My acquaintances would expect me to use mobile banking. 	Ajzen & Fishbein (1980)
Perceived behavioral control (PBC)	Beliefs about how easy or how difficult adopting mobile banking is	<ul style="list-style-type: none"> • I am capable of using mobile banking. • Using mobile banking is entirely within my control. • I have the resources (e.g., references, user's manual, etc.) and the knowledge and the ability to use mobile banking. 	George (2004)
Intention to use (IU)	The extent to which a person is inclined to use or recommend mobile banking to others	<ul style="list-style-type: none"> • I intend to use mobile banking. • I predict that I would continually use mobile banking. • I am willing to strongly recommend mobile banking to others. • I plan to use mobile banking on a regular basis in the future. 	Agarwal & Prasad (1998); Venkatesh & Davis (2000)

innovativeness, 4 items for attitude, 4 items for subjective norm, 3 items for perceived behavioral control, and 4 items for intention. Part 3 includes 4 items related to demographics of a respondent.

To test the research hypotheses, we used two statistical software packages including SPSS 20.0 and Amos 20.0. SPSS 20.0 was used to evaluate the reliability of the measurement items of the constructs and the demographics of the respondents. On the other hand, Amos 20.0 was used to perform the exploratory factor analysis of the measurement model, the hypotheses testing, and the path coefficient analysis.

People of diverse job categories were invited to participate in our survey designed to collect data; they include college students, company employees, and small business owners, among others. The data collection process involved a preliminary survey and a main survey. The results of a preliminary survey became the basis for fine-tuning the questionnaire form that then was used for the main survey.

A preliminary survey was conducted to ensure that the scales for the measures chosen for this study are in adequate form before the main survey is proceeded. We used Google Docs, a Web-based survey tool, to conduct an online questionnaire survey for the duration of ten days. A total of 200 current users of mobile banking apps have been invited by email to participate in the survey, such that a respondent may participate by clicking a link given in the email. Of 84 total responses received, 68 valid responses were used for data analysis after excluding 16 incomplete responses. An assessment of the reliability of the measures based on the data collected from a preliminary survey indicated that overall the measures showed good reliability. The Chronbach's alpha of perceived usefulness was found to be 0.721 which was considered a little low, and thus its items were rephrased to enhance the clarity of the question.

The main survey was conducted over the period of 20 days using both online and offline surveys. The online survey was conducted using the Google Forms application, and the offline survey was conducted in parallel with the online survey to provide an opportunity for some computer-illiterate consumers to participate in the survey using such methods as post office mail and face-to-face responses. 1,500 present users of mobile banking services had been invited to the survey, and 751 responses have been collected with a 50% response rate. Of these, 707 responses were chosen for statistical analysis after invalid or incomplete responses had been excluded. The profile of the respondents is described in Table 3.

4.2. Reliability and Validity of the Measurement Model

First, the reliability of the individual items in the questionnaire has been tested by checking the internal consistency which was measured by reliability coefficients called Cronbach's alphas (or α). The results of reliability analysis of the observed variables are summarized in Table 4. For all the variables, Cronbach's α values have been found to exceed 0.8, and hence satisfy the 0.7 cutoff suggested by Nunnally & Bernstein (1994).

A measurement model should have construct validity as well as reliability, if it is to be validated. Construct validity can be thought of as the degree of correspondence between a construct and its operationalization (Hong & Cho, 2011). Construct validity can be evaluated by assessing (1) unidimensionality, (2) convergent validity, (3) discriminant validity, and (4) nomological validity (Anderson & Gerbing, 1988).

To this end, we first conducted a confirmatory factor analysis to test the unidimensionality of the measurement model. Unidimensionality means the degree to which the assessment measures the same construct and only that construct, and CFA is often used to test whether measures of a construct are consistent with a researcher's understanding of the nature of that construct (or factor). We assessed unidimensionality for the measurement scales, in order to screen and refine questionnaire items. As a result of the assessment, 2 items from the perceived herd behavior (HB) variable have been eliminated. This elimination process is based on the low standardized regression coefficients of the individual measurement items of the observed variables.

Table 3. The respondents profile (N=707)

Attribute	Value	Frequency	Percentage (%)
Gender	Male	480	67.9
	Female	227	32.1
Age	Twenties	107	15.1
	Thirties	175	24.7
	Forties	188	26.5
	Fifties or older	237	33.5
Occupation	Student	20	2.8
	Administrative/clerical	473	66.9
	Sales/marketing	28	4.0
	Technical/production	10	1.4
	Professional	118	16.7
	Self-owned	33	4.7
	Housewife	25	3.5
Frequency of mobile banking use	Daily	53	7.5
	Weekly	181	25.6
	Monthly	77	10.9
	Less frequently than monthly	36	5.1
	Hardly	360	50.9
Primary uses of mobile banking (Check all that apply)	Bank account access	281	39.7
	Fund transfer	309	43.7
	Giro/bill/tax payment	24	3.4
	Credit card account access	36	5.1
	Fund account access	11	1.6
	Others	46	6.5

Next, convergent validity has been tested based on average variances extracted (AVE). In general, a measure is said to have convergent validity, provided that its AVE value is greater than 0.5 (Hair et al., 2006). All the latent variables were found to have AVE values that fall between 0.665 and 0.825, above the 0.5 threshold, and thus their convergent validity seems acceptable.

We then assessed discriminant and nomological validity. We analyzed correlations between research constructs, and the results are shown in Table 5. According to Hair et al. (2006), provided that the minimum AVE value exceeds the between-variable correlation coefficient, discriminant validity is supported. PBC and SE have the largest between-variable correlation coefficient equal to 0.785 which is squared to make 0.61. This number 0.61 does not exceed 0.665, the minimum AVE value (HB), and therefore, it is determined that discriminant validity is supported.

Nomological validity is a form of construct validity that refers to the degree to which a construct behaves as it should within a system of related constructs (the nomological network) (Liu, Li, & Zhu, 2012). As we can see from the correlation coefficients between constructs shown in Table 5, all the hypotheses were found to demonstrate established 'positive' (+) nomological relationships, and all

Table 4. Reliability and confirmatory factor analysis

Latent Variable	No. of Items (Before)	No. of Items (After)	Cronbach's α	Variable Name	Non-Standardized Coefficients (Non-Standardized Factor Loadings)	Standardized Coefficients (Standardized Factor Loadings)	C.R	AVE	Composite Reliability
Perceived usefulness (PU)	4	4	0.919	PU1	.822	.781	26.073	.752	.924
				PU2	1.000	.875	null		
				PU3	.981	.874	32.016		
				PU4	.996	.911	34.665		
Perceived ease of use (PEOU)	4	4	0.916	PEOU1	.930	.818	28.797	.731	.916
				PEOU2	1.000	.888	null		
				PEOU3	.945	.871	32.506		
				PEOU4	.930	.848	30.843		
Perceived security (PS)	4	4	0.838	SC1	.986	.938	52.948	.823	.949
				SC2	1.000	.963	null		
				SC3	.926	.885	42.675		
				SC4	.833	.806	32.721		
Attitude (AT)	4	4	0.945	AT1	.851	.794	27.920	.786	.936
				AT2	1.000	.893	null		
				AT3	1.016	.916	37.815		
				AT4	1.033	.899	36.160		
Perceived herd behavior (HB)	4	2	0.944	HB3	1.000	.835	null	.665	.799
				HB4	.962	.838	19.353		
Self-efficacy (SE)	4	4	0.903	SE1	1.072	.904	38.377	.788	.937
				SE2	1.000	.907	null		
				SE3	1.058	.908	38.879		
				SE4	1.047	.886	36.501		
Personal innovativeness (PI)	3	3	0.928	PI1	.912	.871	29.672	.765	.907
				PI2	1.000	.873	null		
				PI4	.953	.868	29.539		
Subjective norms (SN)	4	4	0.939	SN1	1.000	.844	null	.825	.950
				SN2	1.135	.931	34.370		
				SN3	1.150	.943	35.175		
				SN4	1.059	.853	29.229		
Perceived behavioral control (PBC)	3	3	0.927	PBC1	1.000	.912	null	.808	.926
				PBC2	1.126	.952	43.991		
				PBC3	1.092	.852	33.541		
Adoption intention (AI)	4	4	0.955	IU1	1.000	.945	null	.805	.943
				IU2	.989	.951	53.497		
				IU3	.931	.860	37.665		
				IU4	1.030	.912	45.454		

Table 5. Correlations between the latent variables

Var.	PU	PEOU	PS	AT	HB	SE	PI	SN	PBC	AI	AVE
PU	1										.752
PEOU	.684	1									.731
PS	.334	.356	1								.823
AT	.643	.582	.404	1							.786
HB	.404	.335	.309	.548	1						.665
SE	.531	.728	.314	.528	.255	1					.788
PI	.336	.449	.245	.510	.250	.517	1				.765
SN	.586	.494	.391	.740	.552	.417	.384	1			.825
PBC	.546	.717	.289	.542	.257	.785	.500	.441	1		.808
AI	.660	.600	.446	.774	.527	.576	.436	.656	.589	1	.805
Mean	3.92	3.62	2.45	3.28	3.20	3.83	2.86	3.23	3.79	3.53	
Std. dev.	0.88	0.90	0.89	0.87	1.00	1.00	0.90	0.85	0.96	1.06	

PU: perceived usefulness; PEOU: perceived ease of use; PS: perceived security; AT: attitude; HB: perceived herd behavior; SE: self-efficacy; PI: personal innovativeness; SN: subjective norms; PBC: perceived behavioral control; AI: adoption intention

the between-variable correlation coefficients for these relationships were computed to be ‘positive’ numbers. Since a review of the correlations indicates that the constructs under consideration appear to behave as it should, nomological validity is acceptable.

In addition, we assessed common method bias that may exist with all self-reported data. To assess the severity of common method bias, Harman’s single-factor test (Podsakoff & Organ, 1986) has been performed. For the Harman’s single-factor test, all the variables data in our model were entered into an unrotated exploratory factor analysis. Results from this test showed that the most covariance explained by one factor was 37.69% that was well below the 50% threshold, meaning that common method biases are not a notable concern for this study (Podsakoff & Organ, 1986).

4.3. Hypotheses Testing

Prior to hypotheses testing, we first assessed goodness of fit of the measurement model. First, absolute fit indices were found to be χ^2 (Chi-square) 2220.831, d.f 569, χ^2 /d.f 3.903, and GFI 0.850. Next, incremental fit indices were computed to be NFI 0.919, RFI 0.910, IFI 0.938, TLI 0.932, and CFI 0.938. Finally, parsimony fit indices were found to be PNFI 0.830 and RMSEA 0.064. It turned out that the GFI value was somewhat short of the acceptance threshold ‘0.90,’ but other indices manifested values acceptable within the respective threshold. Hence, the fit of the measurement model is deemed acceptable.

Next, the nomological paths in the research model have been evaluated. Hypothesis H1 predicted that perceived usefulness (PU) was positively related to attitude (AT). As shown in Figure 2 and Table 6, the influence of perceived usefulness on attitude was found to be significantly positive with the path coefficient equal to 0.487 (C.R. 9.661; significance level 0.001). Hence the hypothesis H1 is supported. Hypothesis H2 posited that perceived ease of use(PEOU) would be positively related to attitude(AT). As delineated in Figure 2 and Table 6, the effect of PEOU on AT came out to be significantly positive with the path coefficient of 0.230 (C.R. 4.846; significance level 0.001). Thus, the hypothesis H2 is supported too. Next, hypothesis H3 theorized that perceived security (SC) would have a positive influence on attitude (AT). Figure 2 and Table 6 indicate that the influence that SC has on AT was found to be significantly positive with the coefficient equal to

Figure 2. Results of path analysis

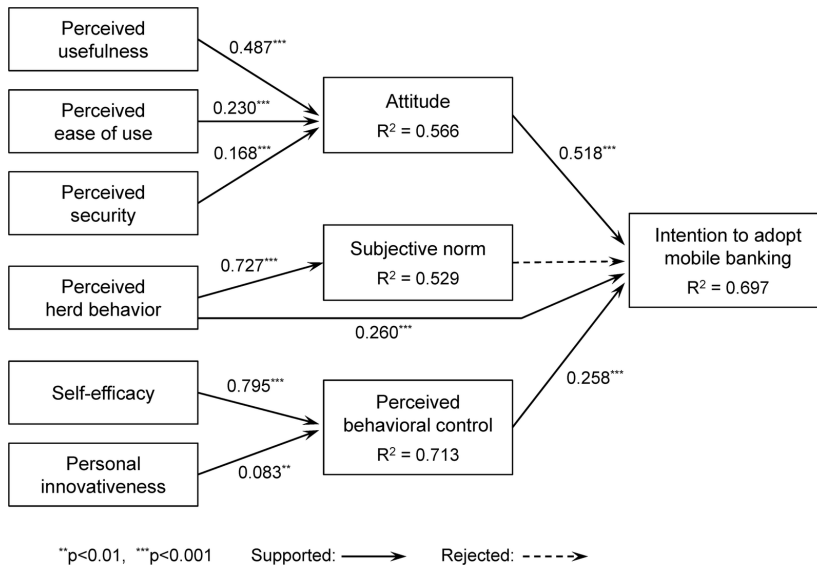


Table 6. Results of hypothesis testing

Hypothesis	Path	Unstandardized Estimates (Non-Standardized Factor Loadings)	Standardized Estimates (Standardized Factor Loadings)	S.E.	C.R.	Decision
H1	PU→AT	.484	.487	.050	9.661	Supported
H2	PEOU→AT	.199	.230	.041	4.846	Supported
H3	PS→AT	.134	.168	.024	5.515	Supported
H4	HB→SN	.632	.727	.039	16.261	Supported
H5	SE→PBC	.689	.795	.030	22.778	Supported
H6	PI→PBC	.088	.083	.032	2.714	Supported
H7	AT→AI	.722	.518	.048	14.993	Supported
H8	SN→AI	-.001	-.001	.055	-.014	Rejected
H9	HB→AI	.304	.260	.058	5.204	Supported
H10	PBC→AI	.302	.258	.033	9.300	Supported

0.168 (C.R. 5.515, significance level 0.001). Therefore, the hypothesis H3 is supported. Hypothesis H4 conjectured that perceived herd behavior (HB) would have a positive effect on subjective norm (SN). As manifested in Figure 2 and Table 6, the relationship between HB and SN turned out to be significantly positive with the path coefficient equal to 0.727(C.R. 16.261, significance level 0.001). Thus, the hypothesis H4 is supported. Hypothesis H5 expected that self-efficacy (SE) would have a positive effect on perceived behavioral control (PBC). As shown in Figure 2 and Table 6, the relationship between SE and PBC was found to be significantly positive with the path coefficient being 0.795 (C.R. 22.778, significance level 0.001). The hypothesis H5 is supported. Next, hypothesis H6 predicted that personal innovativeness (PI) would have a positive effect on

perceived behavioral control (PBC). Our evidence indicates that the impact of PI on PBC turned out to be significantly positive with the path coefficient equal to 0.083 (C.R. 2.714, significance level 0.001). Accordingly, the hypothesis H6 is supported. Hypothesis H7 posited that attitude (AT) would be positively related to adoption intention (IU). As manifested in Figure 2 and Table 6, the influence of AT on IU was calculated to be significantly positive with the path coefficient equal to 0.518 (C.R. 14.993, significance level 0.001). Hence the hypothesis H7 is supported. Next, hypothesis H8 expected that subjective norm (SN) would have a positive effect on adoption intention (IU). Our evidence indicates that the impact of SN on IU was found to be insignificant with the coefficient equal to -0.001 (C.R. -0.014). Thus, the hypothesis H8 is not supported. Hypothesis H9 conjectured that perceived herd behavior (HB) would be positively related to adoption intention (IU). As shown in Figure 2 and Table 6, the influence of HB on IU turned out to be significantly positive with the path coefficient being 0.260 (C.R. 5.204, significance level 0.001). Thus, the hypothesis H9 is supported. Finally, hypothesis H10 predicted that perceived behavioral control (PBC) would have a positive effect on adoption intention (IU). As our evidence reveals, the relationship between PBC and IU was found to be significantly positive with the path coefficient equal to 0.258 (C.R. 9.300, significance level 0.001). Consequently, the hypothesis H10 is supported.

4.4. Discussion

Our hypothesis testing revealed that all but the relationship between subjective norm and acceptance intention were significant. Below we discuss these findings.

4.4.1. Attitude and its Predictors

Hypotheses H1, H2 and H3 are concerned with the influence of mobile banking on adoption attitude, and are all supported. Hypotheses H1 and H2 are based on the TAM that postulate that perceived usefulness and perceived ease of use have a positive effect on attitude. The support of these hypotheses is consistent with the findings from some related studies (Kuo & Yen, 2009; Lu, Zhou, & Wang, 2009). In addition, hypothesis H3 that perceived security is positively related to attitude is supported too. This finding is also consistent with an existing study (Miyazaki & Fernandez, 2001) that identified security risk as a major obstacle to online shopping. When they have great concerns over security, consumers will be reluctant to accept online purchases. Online banking users in Korea have taken security as a top priority issue as hacking incidents occurred at some financial institutions in recent years. In particular, mobile banking users are concerned about the risk of inadvertent leakage of personal information. Therefore, mobile banking users' concerns over security are expected to have led to the significantly positive relationship between perceived security and attitude toward the adoption of mobile banking.

4.4.2. Subjective Norm and its Predictors

Hypothesis H4 posits that perceived herd behavior is positively related to subjective norm, and is supported by our evidence. It implies that consumers' perceived social pressure to conform to recent mobile banking trends positively affects consumers' perceived social pressure to engage in mobile banking. The results suggest that the more consumers feel they need to join the trend, the greater the perception that consumers are expected to use mobile banking. Today, as consumers are exposed to the latest IT trends through mass media, the use of smartphones has greatly increased. And there is a wide recognition that online banking using such mobile devices is a worldwide trend. Thus, consumers using a smartphone are beginning to feel that jumping on this worldwide bandwagon of mobile banking is a wise choice to make.

4.4.3. Perceived Behavioral Control and its Predictors

Hypotheses H5 and H6 illuminate the effects of self-efficacy and personal innovativeness on the behavioral control perceived by consumers of mobile banking. Our findings indicate that they

are both supported. As hypothesis H5 predicted, a positive relationship between self-efficacy and perceived behavioral control was found. The more confident consumers are about the successful use of mobile banking (i.e., higher self-efficacy), the greater the perception that they can maneuver mobile banking as they intended (i.e., greater perceived behavioral control). It can be inferred that the close relationship between the two research constructs is applicable to diverse goal-oriented behaviors, including computer use and Internet use. Meanwhile, the finding for hypothesis H6 revealed that there is a significantly positive relationship between personal innovation and perceived behavioral control. The more innovative consumers are in trying out new information technology, the stronger the perception that the consumers can make the best use of the technology as they wished. Early adopters with relatively high levels of individual innovation are motivated to experience new technologies as soon as possible. Thus, as they focus on acquiring and utilizing the knowledge and resources needed to use the technology, these consumers will likely perceive stronger behavioral control over mobile banking.

4.4.4. Adoption Intention and its Predictors

Hypotheses H7, H8, H9, and H10 address the relationships among perceived herd behavior, subjective norm, perceived behavioral control, attitude, and mobile banking adoption intention. Of these four hypotheses, only hypothesis H9 (concerning the relationship between subjective norm and adoption intention) was rejected and the remaining three were supported. Hypotheses H8, H9, and H10 are theoretically grounded on Ajzen's (1991) theory of planned behavior that would lead us to predict that positive relationships would be significant in all three hypotheses. The finding that hypothesis H8 was rejected implies that even if a consumer believes that his acquaintances expect him to use mobile banking, he may not necessarily adopt mobile banking. People generally decide whether or not to use online banking based on their expected benefits and costs, and so it is unlikely that referents' expectations would influence their own adoption decision. In contrast, hypotheses H7 and H10, which deal with the effects of attitude and perceived behavioral control on adoption intention, are supported. This finding associated with hypothesis H7 implies that a consumer's evaluation of mobile banking (for example, favorable or unfavorable) will affect his adoption decision. Since hypothesis H10 was supported, arguably a consumer who perceives that smart phones can handle mobile banking smoothly is likely to have a higher intent to use mobile banking.

On the other hand, hypothesis H9 establishing a positive relationship between perceived herd behavior and adoption intention is supported. As consumers believe that mobile banking is in wide use and that it is reasonable to jump on the bandwagon, the likelihood that they adopt mobile banking also increases. This is consistent with the theory in social psychology that informational social pressure positively impacts an individual's intention to perform a behavior. Although mobile banking is becoming increasingly popular, consumers are not obliged to follow the fad, but adopt mobile banking with a view to responding to changes in the society.

5. CONCLUSION

The purpose of this study was to present a comprehensive conceptual model to predict mobile banking adoption intention by integrating related theories of technology acceptance. Specifically, we focused on deriving important determinants of the intent to accept mobile banking via a literature review, developing a research model to predict adoption intention, and validate the model using an empirical analysis based on a questionnaire survey.

Our empirical analysis revealed the following findings. Unlike our prediction, Hypothesis H8 establishing a positive relationship between subjective norm and adoption intention was rejected. It may be inferred that even if the acquaintances expect a consumer to accept mobile banking, the consumer does not necessarily intend to follow their expectation since he or she may importantly value

the calculated benefits and costs. On the other hand, the remaining 9 hypotheses were supported as predicted. First, consumer's attitude toward mobile banking is significantly positively influenced by perceived usefulness, perceived ease of use, and perceived security respectively. Second, subjective norm (i.e., referents' expectations about a consumer's use of mobile banking) is significantly positively affected by perceived herd behavior (i.e., perceived social pressure to follow the fad about mobile banking use). Third, perceived behavioral control denoting a consumer's perceptions of his ability to make good use of mobile banking is significantly positively influenced by personal innovativeness as well as self-efficacy. It was confirmed that self-efficacy that refers to a consumer's beliefs about his capabilities to effectively utilize mobile banking is in inseparable relationship with perceived behavioral control. In addition, the personal innovativeness was found to have a positive relationship with perceived behavioral control, implying that an innovative individual has a strong desire to try out a new information technology earlier than others and so have a firm confidence in using the technology. Fourth, a consumer's intention to use mobile banking is significantly positively influenced by three factors including attitude, perceived herd behavior, and perceived behavioral control. In other words, the more positive the consumer's attitude is, the stronger the pressure of the herd behavior as perceived by the consumer. Likewise, the stronger perceptions of the ability to use mobile banking, the more likely it is for the consumer to adopt the mobile banking technology.

5.1. Implications

The findings of this study offer academic as well as practical implications. Academic implications are as follows. First, in this study, we proposed an integrative research model to predict the acceptance of mobile banking by using personal and social influence dimensions. Second, perceived herd behavior and subjective norms have been conceptualized as informational and normative social influences respectively that represent two forms of social influences highlighted in the social psychology literature (Deutsch & Gerard, 1955; Lee & Hong, 2016). This approach is unique in that past studies on technology acceptance concentrated on social influence as a whole without separating the concept into two categories.

On the other hand, the findings of this research provide practical implications for a bank's mobile banking operators and developers. First, in the offline banking environment, operational costs are inevitable because it is necessary to build and operate a brick-and-mortar infrastructure such as branches in order to process customers' transactions. On the other hand, online banking based on the Internet and mobile devices enables a bank to handle customer transactions at a fraction of the operational costs anticipated from the offline counterpart. Therefore, banks that successfully deploy online banking technologies can expect substantial benefits from business process innovation. Moreover, banks that implement mobile banking in parallel with existing Internet banking will not only survive in the increasingly intense competition in the financial industry, but will also find opportunities to create a competitive advantage. Second, banks aiming at successful implementation of business process innovation by deploying a mobile banking system will first need to understand the key antecedents to a consumer's intention to adopt mobile banking services and then develop a business strategy to promote mobile banking usage. In particular, it will help to develop videos and other instructional materials in order to facilitate bank customers' learning, thereby enhancing their self-efficacy for utilizing mobile banking services.

5.2. Limitations and Research Directions

Despite the contributions and implications mentioned above, this study is subject to limitations in several respects. First, the research did not examine whether the culture can play a role in the determination of the behavioral intention to adopt mobile banking. Future research is encouraged to study the model comparatively under two or more cultures. Second, it can be pointed out that the research model presented in this study has been developed as a comprehensive model, but it failed

to include a chief research construct. For example, adoption behavior is not included in our research model and the actual behavior of adopting mobile banking has not been measured. Further research is needed to examine whether adoption intention leads to adoption behavior in mobile banking by testing the expanded model. Third, in-depth research is needed to elucidate the influence of age groups on acceptance intention by dividing survey respondents into groups including older adults and younger adults and observing the research outcomes of the two groups in a comparative manner.

REFERENCES

- Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research*, 9(2), 204–215. doi:10.1287/isre.9.2.204
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11–39). Heidelberg: Springer. doi:10.1007/978-3-642-69746-3_2
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. doi:10.1016/0749-5978(91)90020-T
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Upper Saddle River, NJ: Prentice Hall.
- Ajzen, I., & Madden, T. J. (1986). Prediction of Goal-Directed Behavior: Attitude, Intentions and Perceived Behavioral Control. *Journal of Experimental Social Psychology*, 22(5), 453–474. doi:10.1016/0022-1031(86)90045-4
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423. doi:10.1037/0033-2909.103.3.411
- Asch, S. E. (1956). Studies of independence and conformity: A majority of one against a unanimous majority. *Psychological Monographs*, 70(9), 70–79. doi:10.1037/h0093718
- Bandura, A. (1977). Self-efficacy: Toward a Unifying Theory of Behavioral Change. *Psychological Review*, 84(2), 191–215. doi:10.1037/0033-295X.84.2.191 PMID:847061
- Bandura, A. (1986). *Social Foundations of Thoughts and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (Ed.). (1995). *Self-Efficacy in Changing Societies*. Cambridge: Cambridge University Press. doi:10.1017/CBO9780511527692
- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: Freeman.
- Bikhchandani, A., Hirshleifer, D., & Welch, I. (1998). Learning from the Behavior of Others: Conformity, Fads, and Informational Cascades. *The Journal of Economic Perspectives*, 12(3), 151–170. doi:10.1257/jep.12.3.151
- Chen, Y. F. (2008). Herd behavior in purchasing books online. *Computers in Human Behavior*, 24(5), 1977–1992. doi:10.1016/j.chb.2007.08.004
- Colman, A. M. (Ed.). (2014) *Oxford Dictionary of Psychology* (4th ed.). New York: Oxford University Press.
- Compeau, D., & Higgins, C. (1995). Computer self-efficacy: Development of a measure and initial test. *Management Information Systems Quarterly*, 19(2), 189–211. doi:10.2307/249688
- Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology*, 28(15), 1429–1464. doi:10.1111/j.1559-1816.1998.tb01685.x
- Davis, F. D. (1986). *A Technology Acceptance Model for Empirically Testing New End-User Information System: Theory and Results* [Doctoral Dissertation]. MIT.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *Management Information Systems Quarterly*, 13(3), 319–340.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003. doi:10.1287/mnsc.35.8.982
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgement. *Journal of Abnormal and Social Psychology*, 51(3), 629–636. doi:10.1037/h0046408 PMID:13286010
- Dineshwar, R., & Steven, M. (2013, February 25 - 26). An Investigation on Mobile Banking Adoption and Usage: A Case Study of Mauritius. *Paper presented at the 3rd Asia-Pacific Business Research Conference*, Kuala Lumpur, Malaysia.

- Duan, W., Gu, B., & Whinston, A. B. (2009). Informational cascades and software adoption on the Internet: An empirical investigation. *Management Information Systems Quarterly*, 33(1), 23–48. doi:10.2307/20650277
- Eastin, M. S., & LaRose, R. (2000). Internet Self-Efficacy and the Psychology of the Digital Divide. *Journal of Computer-Mediated Communication*, 6(1). doi:10.1111/j.1083-6101.2000.tb00110.x
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: an introduction to theory and research*. Reading, Massachusetts: Addison-Wesley.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis* (6th ed.). Upper Saddle River, NJ: Prentice Hall.
- Hasan, B. (2006). Delineating the effects of general and system-specific computer self-efficacy beliefs on IS acceptance. *Information & Management*, 43(5), 565–571. doi:10.1016/j.im.2005.11.005
- Hong, I. B., & Cho, H. (2011). The impact of consumer trust on attitudinal loyalty and purchase intentions in B2C e-marketplaces: Intermediary trust vs. seller trust. *International Journal of Information Management*, 31(5), 469–479. doi:10.1016/j.ijinfomgt.2011.02.001
- Igbaria, M. N., Guimaraes, T., & Davis, G. B. (1995). Testing the Determinants of Microcomputer Usage via a Structural Equation Model. *Journal of Management Information Systems*, 11(4), 87–114. doi:10.1080/07421222.1995.11518061
- Joseph, B., & Vyas, S. J. (1984). Concurrent validity of a measure of innovative cognitive style. *Journal of the Academy of Marketing Science*, 12(1), 159–175. doi:10.1007/BF02729494
- Juniper Research. (2018). *Retail Banking: Digital Transformation & Disruptor Opportunities 2018-2022*. Retrieved from http://www.business-standard.com/article/specials/digital-banking-users-to-reach-2-billion-this-year-says-juniper-research-118022801299_1.html
- Kuisma, T., Laukkanen, T., & Hiltunen, M. (2007). Mapping the Reasons for Resistance to Internet Banking: A Means-End Approach. *International Journal of Information Management*, 27(2), 75–85. doi:10.1016/j.ijinfomgt.2006.08.006
- Kuo, Y. F., & Yen, S. N. (2009). Towards an understanding of the behavioral intention to use 3G mobile value-added services. *Computers in Human Behavior*, 25(1), 103–110. doi:10.1016/j.chb.2008.07.007
- Laukkanen, T. (2007). Internet vs mobile banking: Comparing customer value perceptions. *Business Process Management Journal*, 13(6), 788–797. doi:10.1108/14637150710834550
- Lee, J., & Hong, I. B. (2016). Predicting Positive User Responses to Social Media Advertising: The Roles of Emotional Appeal, Informativeness, and Creativity. *International Journal of Information Management*, 36(3), 360–373. doi:10.1016/j.ijinfomgt.2016.01.001
- Lee, M. C. (2009). Factors Influencing the Adoption of Internet Banking: An Integration of TAM and TPB with Perceived Risk and Perceived Benefit. *Electronic Commerce Research and Applications*, 8(3), 130–141. doi:10.1016/j.elerap.2008.11.006
- Liu, L., Li, C., & Zhu, D. (2012). A New Approach to Testing Nomological Validity and Its Application to a Second-Order Measurement Model of Trust. *Journal of the Association for Information Systems*, 13(12), 950–975. doi:10.17705/1jais.00320
- Lu, Y., Zhou, T., & Wang, B. (2009). Exploring Chinese users' acceptance of instant messaging using the theory of planned behavior, the technology acceptance model, and the flow theory. *Computers in Human Behavior*, 25(1), 29–39. doi:10.1016/j.chb.2008.06.002
- Luarn, P., & Lin, H. (2005). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, 21(6), 873–891. doi:10.1016/j.chb.2004.03.003
- Martins, C., Oliveira, T., & Popović, A. (2014). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, 34(1), 1–13. doi:10.1016/j.ijinfomgt.2013.06.002
- Miyazaki, A., & Fernandez, A. (2001). Consumer perceptions of privacy and security risks for online shopping. *The Journal of Consumer Affairs*, 35(1), 27–44. doi:10.1111/j.1745-6606.2001.tb00101.x

- Moore, G. C., & Benbasat, I. (1991). Development of and Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, 2(3), 192–222. doi:10.1287/isre.2.3.192
- Nunnally, J. C., & Bernstein, I. (1994). *Psychometric Theory* (3rd ed.). New York: McGraw-Hill.
- Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(4), 531–544. doi:10.1177/014920638601200408
- Rogers, E. M. (1995). *Definition of Innovation* (4th ed.). New York: The Free Press.
- Saga, V. L., & Zmud, W. (Eds.). (1994). *The Nature and Determinants of IT Acceptance, Routinization and Infusion*. Amsterdam: Elsevier Science.
- Swaminathan, V., Lepkowskawhite, E., & Rao, B. P. (1999). Browsers or Buyers in Cyberspace? An Investigation of Factors Influencing Electronic Exchange. *Journal of Computer-Mediated Communication*, 5(2).
- Sykes, T. A., Venkatesh, V., & Gosain, S. (2009). Model of acceptance with peer support: A social network perspective to understand employees' system use. *Management Information Systems Quarterly*, 33(2), 371–393. doi:10.2307/20650296
- Tan, M., & Teo, T. S. H. (2000). Factors Influencing the Adoption of the Internet Banking. *Journal of the Association for Information Systems*, 1(5), 1–42. doi:10.17705/1jais.00005
- Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, 46(2), 186–204. doi:10.1287/mnsc.46.2.186.11926
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *Management Information Systems Quarterly*, 27(3), 425–478. doi:10.2307/30036540
- Wixom, B. H., & Todd, P. A. (2005). A Theoretical Integration of User Satisfaction and Technology Acceptance. *Information Systems Research*, 16(1), 85–102. doi:10.1287/isre.1050.0042
- Zaltman, G., Duncan, R., & Holbek, J. (1973). *Innovation and Organizations*. New York, NY: Wiley.

Ilyoo B. Hong is presently professor of management information systems at Chung-Ang University, Seoul, Korea. He earned his PhD degree in MIS from the University of Arizona, his MS in Business from the University of Illinois at Urbana-Champaign, and his BS in Management from Indiana University. He was a visiting scholar at the UCLA Anderson School of Management. Ilyoo Hong has published in such journals as Decision Sciences, Information & Management, and International Journal of Information Management, among others. He also presented academic papers at numerous international conferences, including HICSS. His research interests include building online consumer trust, assessing the electronic word-of-mouth, and evaluating reciprocal trust in the sharing economy.