Understanding Internet Banking Adoption and Continue-Use Behavior: A Hong Kong Perspective

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Abstract

This study investigates adoption/continue-use behavior within the context of Hong Kong Internet Banking services. A research framework based on the extended Technology Acceptance Model (TAM2) and Social Cognitive Theory was developed to identify factors that would influence the adoption/continue-use of Internet Banking. Structural Equation Modeling (SEM) was employed to examine the entire pattern of inter-correlations among the eight proposed constructs, and to test related propositions empirically. The results reveal that both subjective norm and computer self-efficacy indirectly play significant roles in influencing the intention to adopt Internet Banking. Perceived ease of use has a significant indirect effect on intention to adopt/continue-use through perceived usefulness, while its direct effect on intention to adopt is not significant in this study.

1. Introduction

Following the approach taken by Karahanna, Straub, and Chervany [30], this study combines innovation attributes and attitude theories in a theoretical framework to examine potential and early adopters' reasons for adopting and continuing to use Internet Banking. This study also attempts to provide a better theoretical understanding of the antecedents of user acceptance and user resistance to adoption and continue-use of Internet Banking in Hong Kong. In addition, it extends TAM by adding perceived risk and computer self-efficacy as external variables for perceived usefulness and perceived ease of use.

2. Literature Review

This study lies at the intersection of two issues. The first is the technology adoption decision-making process. The second is the determinants of information technology acceptance and utilization among users.

2.1 Social Psychology

Information systems investigators have suggested intention models from social psychology as a potential theoretical foundation for research on the determinants of user behavior [42]. Fishbein and Ajzen's [22] Theory of Reasoned Action (TRA) is an especially widely validated intention model that has been proven successful in predicting and explaining behavior across a wide variety of domains.

2.1.1 Theory of Reasoned Action

TRA is a widely studied model from social psychology, and is concerned with the determinants of consciously intended behaviors [3][22]. It is composed of attitudinal, social influence, and intention variables to predict behavior. TRA hypothesizes that an individual's Behavioral Intention (BI) to perform a behavior is jointly determined by the individual's Attitude Toward performing the Behavior (ATB) and Subjective Norm (SN), which is the overall perception of what relevant others think the individual should or should not do.

2.1.2 Theory of Planned Behavior

Despite the predictability of TRA being strong across studies, it becomes problematic if the behavior under study is not under full volitional control. To deal with these problems, Ajzen [1][2] extended TRA by including another construct called perceived behavioral control, which predicts both behavioral intention and behavior. The extended model is called the Theory of Planned Behavior (TPB).

2.2 Information Technology Acceptance

2.2.1 Technology Acceptance Model

The Technology Acceptance Model (TAM), introduced by Davis [20], is an adaptation of TRA specifically tailored for modeling user acceptance of information systems. TAM identifies a small number of fundamental variables suggested by previous research dealing with the cognitive and affective determinants of computer acceptance, and uses TRA as a theoretical backdrop for modeling the theoretical relationships among these variables. TAM posits that two particular behavioral beliefs, Perceived Usefulness (PU) and Perceived Ease Of Use (PEOU) are of primary relevance for computer acceptance behavior.

2.2.2 Extended Technology Acceptance Model

Venkatesh and Davis [48] added a number of determinants of PU to TAM to develop and test an extended TAM (TAM2). It is a theoretical extension of TAM, which explains PU and usage intention in terms of social influence processes (Subjective Norm, Voluntariness, and Image) and cognitive instrumental processes (Job Relevance, Output Quality, Result Demonstrability and PEOU).

2.3 Risk Perception

Risk perception is also a critical factor affecting the rate of adoption. Frambach [23][24] contended that the level of Perceived Risk (PRISK) is negatively related to

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the speed of adoption. Ostlund [38] introduced risk as an additional measurement in IT adoption. A common and widely recognized obstacle to electronic commerce adoption has been the lack of security and privacy over the Internet [10][16][40].

2.4 Social Cognitive Theory - Self-Efficacy

Social Cognitive Theory (SCT) [6][7][8][9], also called Social Learning Theory (SLT), is a widely accepted model of individual behavior. A key element in SCT is the concept of self-efficacy (SE), which refers to an individual's belief in his or her own capability to perform a specific task. Estimations of SE are formed through a gradual and dynamic weighting, integration, and evaluation of complex cognitive, linguistic, social, and/or enactive experiences.

3. Methodology

3.1 The Research Framework

The attitude literature, including social psychology and technology acceptance, provides the theoretical framework needed to define the linkages between beliefs about adopting and using Internet Banking, while TAM2 provides the underlying structure for the theoretical model of the study. The proposed conceptual model of Internet Banking adoption for this study is shown in Figure 1.
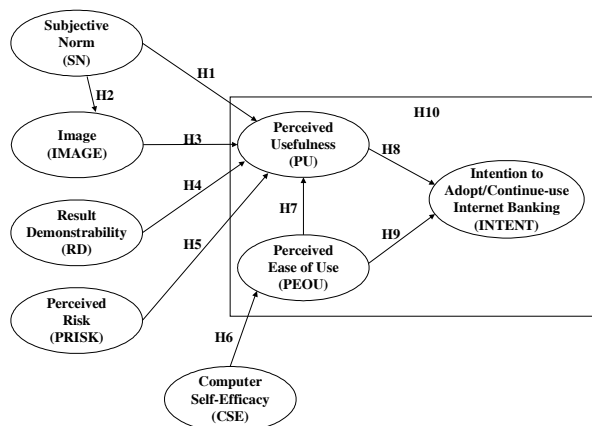
Figure 1 Proposed Internet Banking Adoption/ Continue-use Model

The ten hypotheses required for the model test are shown in the first two columns of Table 1.

3.2 Questionnaire Design

Theoretical constructs were operationalized using validated items from prior research and the results of the elicitation study.

3.3 Respondents

The researcher limited the sampling frame to students under the age of 40 at the seven government-funded institutes of higher learning in Hong Kong. Eight hundred questionnaires were distributed with 634 responses (79.25% response rate). Of these, 183 were Internet Banking users and 451 were potential adopters of Internet Banking. After cases with missing data were eliminated,

the final sample consisted of 499 observations, of which 147 were users and 352 were potential adopters of Internet Banking. Males and females are approximately evenly distributed.

4. Data Analysis

The proposed research model was tested separately with the samples of users and potential adopters of Internet Banking via the structural path model. The partial aggregation approach was employed to reduce the level of random error. The results are as follows.

4.1 Users of Internet Banking

Analysis results indicate that INTENT was predicted by SN ($\beta = 0.47$, $p < 0.01$) and PU ($\beta = 0.53$, $p < 0.01$), which in turn was predicted by IMAGE ($\beta = 0.11$, $p < 0.10$), RD ($\beta = 0.40$, $p < 0.01$), and PEOU ($\beta = 0.48$, $p < 0.01$). PEOU was predicted by CSE ($\beta = 0.63$, $p < 0.01$). Image was predicted by both SN ($\beta = 0.39$, $p < 0.01$) and RD ($\beta = 0.40$, $p < 0.01$). The model explained substantial item variance: 34% of the variance in INTENT, 28% in PU, 60% in PEOU, and 52% in IMAGE.

4.2 Potential Adopters of Internet Banking

For potential adopters of Internet Banking , INTENT was predicted by IMAGE ($\beta = 0.42$, $p < 0.01$), SN ($\beta = 0.25$, $p < 0.01$), and PU ($\beta = 0.15$, $p < 0.05$). PU was predicted by PEOU ($\beta = 0.58$, $p < 0.01$), SN ($\beta = 0.16$, $p < 0.01$), IMAGE ($\beta = 0.10$, $p < 0.05$), and PR ($\beta = -0.22$, $p < 0.01$). PEOU was predicted by CSE ($\beta = 0.71$, $p < 0.01$). IMAGE was predicted by both SN ($\beta = 0.19$, $p < 0.01$) and RD ($\beta = 0.53$, $p < 0.01$). The above model also explained substantial item variance; 53% in INTENT, 34% in PU, 49% in PEOU, and 58% of variance in IMAGE.

Table 1 shows a summary of research results for both users and potential adopters of Internet Banking.

	Hypotheses	Users	Potential Adopters
H1	Subjective Norm will have a positive direct effect on Perceived Usefulness	Not Supported	Supported
H2	Subjective Norm will have a positive effect on Image	Supported	Supported
H3	Image will have a positive effect on Perceived Usefulness	Supported	Supported
H4	Result Demonstrability will have a positive effect on Perceived Usefulness	Supported	Not Supported
H5	Perceived Risk will have a negative effect on Perceived Usefulness	Not Supported	Supported
H6	Higher Computer Self-Efficacy will have a positive effect on Perceived Ease of Use	Supported	Supported
H7	Perceived Ease of Use will have a positive effect on Perceived Usefulness	Supported	Supported
H8	Perceived Usefulness will have a positive effect on Intention to Adopt/Continue-use	Supported	Supported
H9	Perceived Ease of Use will have a positive effect on Intention to Adopt/Continue-use	Not Supported	Not Supported
H10	Perceived Usefulness and Perceived Ease of Use will fully mediate the influence of selected variables on Intention to Adopt/Continue-use	Not Supported	Not Supported

Table 1 Summary of Research Results

5. Discussion

5.1 Intention to Adopt/Continue-use of Internet Banking

PU ($\beta = 0.53$ for users and $\beta = 0.15$ for potential adopters) is significantly positively related to INTENT, with 34% of variance of Intention to Continue-use and 53% of variance of Intention to Adopt, accounted for. This result is consistent with previous studies on TAM. It implies that if users/potential users perceive Internet Banking to be useful, they will be more likely to continue-use/adopt the innovation. Therefore, the result supports H8. The data also revealed that the effect of PU on intention was stronger for users than for potential users. On the other hand, PEOU is not significantly related to INTENT, contradicting expectations. Thus, H9 is not supported by the findings. This finding concurs with the original TAM but contradicts the results of many previous studies [33][37]. Furthermore, SN showed a significant positive relation to INTENT. This means that users feel more positive about using Internet Banking when the social environment encourages its use. This finding concurs with the extended Triandis Model by Cheung, Chang, and Lai [15], and the extension of TAM by Venkatesh and Davis [48]. However, the setting was different from studies by Venkatesh and Davis, in that the current context (Adopt/Continue-use of Internet Banking) is not mandatory. In addition, Image ($\beta = 0.42$) was found to be the most significant factor affecting INTENT. Therefore, as the study has shown, IMAGE and SN were the main factors affecting INTENT for potential adopters.

5.2 Perceived Usefulness

Looking at the antecedents of PU, only IMAGE was significantly positively related to PU for both users and potential adopters of Internet Banking. The results support H3 that Image has a positive direct effect on Perceived Usefulness of Internet Banking. For potential users, SN and PRISK were respectively significantly positively and negatively related to PU, that is, both H1 and H5 are supported. However, H1 and H5 are not supported for users of Internet Banking. It could be argued that once users have adopted Internet Banking, their perceived usefulness is based mainly on their own personal evaluation of the technology, rather than SN. As for the different results of H5, PRISK ($\beta = -0.22$) was significantly negatively related to PU for potential users. No significant relationship was found between PRISK and PU for users.

The finding of RD ($\beta = 0.40$) implies that if Internet Banking produces effective/positive results desired by the users, they are more likely to understand how useful Internet Banking is. Therefore, H4 is supported for users. However, potential users may not be aware of these effective or positive results, or they may have no idea whether these results would be positive or negative. So, there is no support for H4 for potential users.

Furthermore, PEOU ($\beta = 0.48$ for users and $\beta = 0.58$ for potential adopters) was found to be the most significant factor affecting PU, although it had no statistically significant influence on INTENT. The individuals' assessment of the usefulness of the innovation is influenced by the innovation's ease of use. All of which supports H7.

5.3 Perceived Ease of Use

CSE ($\beta = 0.63$ for users and $\beta = 0.71$ for potential adopters) was found to be a statistically significant factor of PEOU, and 49% and 60% of variance of PEOU was accounted for potential adopters and users respectively. The finding implies that individuals with higher CSE will perceive Internet Banking as easier to use. Therefore, H6 is supported. The data also reveal that the effect of CSE on PEOU was stronger for potential adopters than for users.

5.4 Image

H2 is supported. Both SN and RD were significantly positively related to IMAGE for both users and potential adopters of Internet Banking, and a large variance (52% for users and 58 % for potential adopters) in IMAGE was explained in the final model. The first part of the results conformed to prior studies of TAM2 [48], which theorize that SN positively influence image.

6. Conclusion

In this study, factors influencing the adoption/ continue-use of Internet Banking are identified in the Hong Kong context. The results reveal that CSE plays an indirect, but significant role in influencing both intentions to adopt and continue-use of Internet Banking. Differences are found between the determinants of adopting and continuing to use Internet Banking. Risk perceptions of potential adopters hindered the adoption of Internet Banking. The majority of IS research in the belief/attitude tradition to date has focused on beliefs and attitudes related to usage of IT. Hence, our understanding of beliefs, attitudes, and norms leading to IT adoption and how these are modified over time is limited. Preliminary evidence from the current study suggests that perceptions of image enhancement induce initial adoption, while sustained usage decisions are based solely on beliefs of PU and SN. These results represent a first step toward a deeper understanding of the temporal evolution of beliefs, attitudes, norms, and behavior across different phases of the adoption process. Moreover, the degree of the mediating effect of PU is very high in continue-use intention, whereas it is not strong when explaining the adoption intention. PEOU is found to be an important antecedent of PU; however, its mediating effects on both adoption and continue-use intentions are not significant.

References will be provided upon request