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Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit

Ming-Chi Lee

Department of Information Engineering, National Pingtung Institute of Commerce, No. 51, Minsheng E. Rd., Pingtung, Taiwan, ROC

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ABSTRACT

Online banking (Internet banking) has emerged as one of the most profitable e-commerce applications over the last decade. Although several prior research projects have focused on the factors that impact on the adoption of information technology or Internet, there is limited empirical work which simultaneously captures the success factors (positive factors) and resistance factors (negative factors) that help customers to adopt online banking. This paper explores and integrates the various advantages of online banking to form a positive factor named perceived benefit. In addition, drawing from perceived risk theory, five specific risk facets – financial, security/privacy, performance, social and time risk – are synthesized with perceived benefit as well as integrated with the technology acceptance model (TAM) and theory of planned behavior (TPB) model to propose a theoretical model to explain customers' intention to use online banking. The results indicated that the intention to use online banking is adversely affected mainly by the security/privacy risk, as well as financial risk and is positively affected mainly by perceived benefit, attitude and perceived usefulness. The implications of integrating perceived benefit and perceived risk into the proposed online banking adoption model are discussed.

1. Introduction

With the rapid growth of Internet technology, online banking has played an important and central role in the e-payment area which provides an online transaction platform to support many e-commerce applications such as online shopping, online auction, Internet stock trading and so on. However, despite the fact that online banking provides many advantages, such as faster transaction speed and lower handling fees (Kalakota and Whinston, 1997), there are still a large group of customers who refuse to adopt such services due to uncertainty and security concerns (Kuisma et al., 2007; Littler and Melanthiou, 2006). Therefore, understanding the reasons for this resistance would be useful for bank managers in formulating strategies aimed at increasing online banking use.

Consumers have shown reluctance to complete simple online purchases (Donna et al., 1999), primarily due to risk concerns (Jarvenpaa et al., 1999; Pavlou, 2001) and, thus perceived risk is posited as a prominent barrier to consumer acceptance of online banking. Compared to online purchases, the adoption of online banking adoption is typically more complex, as it initiates a long-term relationship between the consumer and online banking services. There is a lot at stake for consumers as they contemplate entering into a business relationship with distant, faceless online banking services. Although consumer perceptions of the risks of adopting online banking have been studied by many researchers (Liao et al., 1999; Tan and Teo, 2000; Yousafzai et al., 2003), the perceived risk variable has only been modeled as a single construct, which fails to reflect the real characteristics of perceived risk and explain why consumers resist such banking services. To provide a deeper understanding of the perceived risks of adopting online banking, we carried out a more in-depth study of the characteristics of the perceived risks. We divided perceived risk into five categories: performance, financial, time, social and security/privacy risks, as theorized by Jacoby and Kaplan (1972), in order to clarify which risk facets are more important in this field.

Although several research projects have focused on the factors that impact on the adoption of information technology or Internet for the past decade (Heijden, 2003; Taylor and Todd, 1995), there is limited empirical work which captures the success factors or positive factors of online banking to help form a strategic agenda. In this study, besides negative factors, we explore and integrate the advantages of online banking to develop a predictor named perceived benefit to explain and predict customer intention to adopt online banking.

In order to provide a solid theoretical basis for examining the adoption of online banking services, this paper draws on two schools of thought regarding the nomological structure of the theory of reasoned action (TRA): (1) the technology acceptance model (TAM) (Davis et al., 1989), and (2) the theory of planned behavior

E-mail address: lmc@npic.edu.tw

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(TPB) (Azjen, 1991). Since TAM and TPB have been used in many studies to predict and understand user perceptions of system use and the probability of adopting an online system (Gefen et al., 2003; Hsu and et al., 2006; Wu and Chen, 2005), they are the most appropriate tools for understanding online banking adoption. This study proposes to integrate the five facets of perceived risk listed above with the TAM and TPB in order to provide a more comprehensive model of online banking evaluation and adoption.

This study enlarges the scope of the adoption decision to explicitly include both negative (perceived risk) and positive factors (perceived benefits) simultaneously. The research may give practitioners an increased understanding of customers' risk perceptions which can then be used to devise risk-reducing strategies and trust-building mechanisms to encourage online trading adoption, especially in the emerging area of e-payments. The purposes of this study are as follows:

1. To investigate whether perceived risk and benefit significantly impact customers' behavioral intention to use online banking adoption.
2. To clarify which factors are more influential in affecting the decision to use online banking.
3. To evaluate whether the integration of TAM with TPB provide a solid theoretical basis for examining the adoption of online banking.

This paper proceeds as follows: Section 2 introduces perceived risk, perceived benefit and the theoretical foundations. Section 3 outlines our research model and hypotheses. Section 4 details the methodology and research design, and Section 5 presents the data analysis and hypotheses testing results. Section 6 discusses our research findings. Section 7 provides implications, and finally Section 8 concludes with this paper's limitations, and potential topics for future research.

2. Perceived risk, perceived benefit and theoretical background

Since the 1960s, perceived risk theory has been used to explain consumers' behavior. Considerable research has examined the impact of risk on traditional consumer decision making (Lin, 2008). Peter and Ryan (1976) defined perceived risk as a kind of subjective expected loss, and Featherman and Pavlou (2003) also defined perceived risk as the possible loss when pursuing a desired result. Cunningham (1967) noted that perceived risk consisted of the size of the potential loss (i.e. that which is at stake) if the results of the act were not favorable and the individual's subjective feelings of certainty that the results will not be favorable. Most of scholars claimed that consumers' perceived risk is a kind of a multi-dimensional construct. Six components or types of perceived risk have been identified: financial, performance, social, physical, privacy, and time-loss (Jacoby and Kaplan, 1972; Kaplan et al., 1974; Roselius, 1971). However, the dimensions of perceived risk may vary according to the product (or service) class Featherman and Pavlou, 2003. Online banking does not incur any threat to human life; therefore, measures of physical risk were not included in this study. We define perceived risk in online banking as the subjectively determined expectation of loss by an online bank user in contemplating a particular online transaction. The dimensions of perceived risk were defined in Table 1.

2.1. Perceived risks of online banking

The present research investigated five types of risk – security/privacy, financial, social, time/convenience, and performance loss, and the details of these five risks related to online banking are described as follows:

1. *Security/privacy risk:* This is defined as a potential loss due to fraud or a hacker compromising the security of an online bank user. Phishing is a new crime skill by which phishers attempt to fraudulently acquire sensitive information, such as usernames, passwords and credit card details, by masquerading as a trustworthy entity in an electronic communication (Reavley, 2005). A phising attack takes places when a user receives a fraudulent email (often referred to as a spoof email) representing a trusted source that leads them to an equally fraudulent website that is used to collect personal information (Entrust, 2008). Both fraud and hacker intrusion not only lead to users' monetary loss, but also violate users' privacy, a major concern of many Internet users. Many consumers believe that they are vulnerable to identity theft while using online banking services (Littler and Melanthiou, 2006).
2. *Financial risk:* It is defined as the potential for monetary loss due to transaction error or bank account misuse. According to Kuisma et al. (2007), many customers are afraid of losing money while performing transactions or transferring money over the Internet. At present online banking transactions lack the assurance provided in traditional setting through formal proceedings and receipts. Thus, consumers usually have difficulties in asking for compensation when transaction errors occur (Kuisma et al., 2007).
3. *Social risk:* This refers to the possibility that using online banking may result in disapproval of one's friends/family/work group. It is possible that one's social standing may be enhanced or diminished depending on how online banking is viewed. It may well be that people have unfavorable or favorable perceptions of online banking that in turn affect their views of its adopters; or, alternatively, not adopting online banking may also have negative or positive connotations.
4. *Time/convenience risk: It* may refer to the loss of the time and inconvenience incurred due to the delays of receiving the payment or the difficulty of navigation (finding appropriate services and hyperlinks). Two leading causes of dissatisfying online experiences that may be thought of as a time/convenience risk include a disorganized or confusing Web site and pages that are too slow to download (Forsythe and Shi, 2003). It may also be related to the length of time involved in waiting the website or learning how to operate online banking website.

Table 1
Dimensions of perceived risk.

Dimension	Definition
Performance risk	The possibility of the product malfunctioning and not performing as it was designed and advertised and therefore failing to deliver the desired benefits
Social risk	Potential loss of status in one's social group as a result of adopting a product or service, looking foolish or untrendy
Financial risk	The probability that a purchase results in loss of money as well as the subsequent maintenance cost of the product
Privacy risk	Potential loss of control over personal information, such as when information about you is used without your knowledge or permission. The extreme case is where a consumer is "spoofed" meaning a criminal uses their identity to perform fraudulent transactions
Time risk	Consumers may lose time when making a bad purchasing decision by wasting time researching and making the purchase, learning how to use a product or service only to have to replace it if it does not perform to expectations
Physical risk	The probability that a purchased product results in a threat to human life