Prior studies found that Internet banking adoption and electronic payment adoption including plastic payment cards share common determinants and barriers. However, no prior studies investigated if plastic payment cards adoption and use has any influence on consumers to adopt and use Internet banking. Hence, this exploratory paper was motivated to investigate the type of relationship that exists between these two e-services.

KEYWORDS: E-payment, Internet Banking, Plastic cards, and TAM

INTRODUCTION

The literature of Internet banking (IB) adoption shows a wide range of studies that investigated the determinants of IB adoption or the barriers from its adoption by banks' customers. After reviewing several studies that investigated IB adoption in the last two decades, this paper found that the IB determinants/barriers in developed and developing countries are the following: security, privacy, risk, relative advantage, compatibility, trialability, complexity, computer self-efficacy, perceived ease of use, perceived usefulness, perceived credibility, trust, legal support, income, education, gender, age, speed, and fees and charges (Sathye, 1999; Tan & Teo, 2000; Wang, et al., 2003; Rotchanakitumnuai & Speece, 2003; Kolodinsky, et al., 2004; Poon, 2007; Lee, 2009; Chong, et al., 2010; Zhao, et al, 2010; Dimitriadis, et al, 2011). The most common determinants/barriers found in most of these studies can be grouped under three clusters – technology acceptance model (TAM), diffusion of innovation, and trust. On the other hand, plastic cards (e.g., credit card and debit card) adoption’s determinants/barriers share the same three group factors of IB (Szmigin & Bourne, 1999; Antonides, et al., 1999; Hogarth, et al., 2008; Wang, 2008; Zhu & Chen, 2011). Furthermore, Eastin (2002) found that Internet banking adoption and electronic payment adoption (using credit cards and debit cards) share common attributes represented by the three factors mentioned above. Therefore, this paper suggests the following research question: How would plastic cards adoption and use affect Internet banking adoption and use?

Also, for motivation purposes, this paper reviewed some statistics related to IB adoption and use as well as plastic card adoption and use. After the review of these statistics, this paper found that nations with high number of credit cards holders have high Internet banking adoption, and nations with high cash and cheque transactions have low Internet banking adoption. For example, the primary banking method for the US consumers is Internet banking, and at the same time 78 percent of US households have one or more credit cards (178.5 million credit cardholder and 576 million credit cards in circulations (IB, 2009; CardHub, 2010; Woolsey & Schulz, 2010). Also, Japan has 2.56 credit cards per capita, while almost two third use Internet banking (Yasumoto, 2010). On the other hand, only about 1% of India's overall consumer spending comes from debit and credit cards (0.02 credit cards per capita), while only 7% of Indians use Internet banking (Chu, 2010; BusinessStandard, 2011).
Previous literature of Internet banking adoption never studied the effect of plastic cards use on Internet banking adoption and use. Even after all these rich and valuable studies have been made through the last two decades, the numbers of Internet banking adopters do not reflect any practical contribution of these studies’ findings. Even in the developed countries such as the European countries where laws and regulations have been set to protect Internet users’ online security, the numbers of IB users are not as much as they are suppose to be. These countries have high technology infrastructure including wide Internet availability and fast Internet connection. What would be the reasons for the developed countries’ citizens not to use IB? For example, IB is only used by 53% of French, 45% of British, 43% of Germans, 38% of Austrians, 34% of Irish, 19% of Hungarians, and 18% of Italians, (DataMarket, 2010). However, Internet users’ numbers are over 80% in France, United Kingdom, and Germany (WorldBank, 2014). In this paper’s process of investigating the potential reasons behind the moderate to low IB use in these countries, the findings highlights low plastic card use over there. For example, in Italy credit and debit cards are costly as credit card holders get charged annual fees between $51 and $160, while debit card holders get charged annual fee between $15 and $30 with $1 to $3 charge on each purchase, thus Italians prefer using cash (JustLanded, 2014). Furthermore, the rates of credit card use are affected by the banking restriction for issuing credit cards, especially after the global economic crisis. For example, in the UK, the use of credit cards dropped 13% (BBC, 2011).

The adoption of IB in many developed countries did not pass the 50%, then how about in the developing countries such as Vietnam and Thailand? How would the findings of the researches of IB adoption in such developing countries be relevant to practice if most of the stores there do not accept credit and debit cards as a method of payment? Therefore, this paper argues that if banks do not facilitate the restrictions on issuing credit cards to consumers, and do not stop charging annual fees for debit and credit cards’ use, then IB will only be used for convenience purposes. On the other hand, this paper argues that credit and debit cards’ users who make a lot of purchase transactions as well as high monetary value purchases, they use IB to monitor and supervise their spending. Furthermore, they can make sure that they have not been overcharged by the seller or retailer, especially when they shop online using specific websites. IB helps consumers to trust credit and debit cards as a reliable payment method.

**LITERATURE REVIEW**

**Internet Banking**

Internet banking is a pool of many banking services that are provided by banks to financial customers through Internet such as automatic bill payment and electronic transfer of funds (Kolodinsky, et al., 2004).

IB is a transactional and informational medium, which include viewing account balances and transaction histories, printing statements, transferring funds between accounts, requesting credit card advances and check credit card bills, paying bills, ordering and writing checks (Tan & Teo, 2000; Chou & Chou, 2000; Nath, et al, 2001; Akinci et al, 2004). Also, additional services are provided such as buying insurances, applying and managing investments like stocks, mortgages, and loans (Nath, et al, 2001; Akinci et al, 2004).

Internet banking services are critical for the survival of banks in the long term (Tan & Teo, 2000), especially that the number of Internet users in the world is growing very fast as well as Internet banking users. The average number of Internet users increases by 19.2 percent
annually throughout the world; in France the average number of Internet banking users' increases 10 percent. 83 percent of Internet users in Norway use IB, and 75 percent in Sweden (WorldBank, 2009; DataMarket, 2010).

The reason behind using the Internet to serve customers that have been served face-to-face in physical branches is for the mutual benefit of banks and customers. Internet banking helps banks to improve their services because it provides customers with 24/7 access to their banking information as well as to perform banking transactions (Dawes & Rowley, 1998; Tan & Teo, 2000). Also, banks gain competitive advantages when offering Internet banking because they attract new customers that are represented by the e-commerce adopters, especially in developing countries where Internet banking is still at the infancy stage, such as Vietnam and Sudan, which are still building up their information technology infrastructure (Chong et al., 2010; Alam et al, 2010). On the other hand, IB decreases banks’ costs and increases their profits because the average transaction cost at a physical bank branch is $1.07 comparing to one cent at a bank’s website (Nath, et al, 2001). The cost of running Internet banking is 40 percent less than the cost of operating at a physical branch (Tan & Teo, 2000; Nath, et al, 2001). Also, with the increase of Internet banking use, banks do not need as much physical branches as they used to, for example Bank of America 2009 closed approximately ten percent of its branches (600 locations) in the US (IB, 2009).

It has been stated by previous literature that national culture plays a main role in influencing the use of information technology (Straub 1994; Walsham 2002; Leidner & Kayworth, 2006). Studies in Arab countries identified many cultural values that affect the adoption of IT products such as face-to-face communications preference, commitment to family and kinship obligations, religion, valuing the past, etc. these cultural aspects work sometimes as facilitators and some other times as barriers for technology transfer and adoption (Hill, et al., 1998; Straub, et al., 2001). Therefore, this paper argues that if banks succeed marketing plastic cards to replace cash and cheques as a payment method, then IB adoption will overcome the obstacles or barriers represented by national culture.

Internet banking security and privacy are the main constructs of consumer’s trust in banking through the Internet (McKnight and Chervany, 2002; McKnight, et al, 2002; Chong, et al, 2010). Security is proved in many empirical studies (Table1) as one of the main factors affecting consumer behavior towards adopting e-commerce. Also, trust in Internet security has been an imperative reason for consumers not adopting online products and services such as purchasing online or using Internet banking where financial exchanges are involved as well as personal and financial information are revealed to unknown party (Lee & Turban, 2001; Gummerus et al, 2004).

Government support for technology infrastructure such as Internet security is an important factor that affects trust, which in turn affects Internet banking adoption. In Vietnam, government support was found positively related with Internet banking adoption. The unclear Internet security and privacy laws in Vietnam, and the unclear e-commerce regulations regarding online transactions’ safety are major barriers to IB adoption (Chong, et al., 2010). In Thailand, legal support was found as a major barrier for IB adoption. The inefficient legal support implementation could not increase consumers’ trust in IB security. Thai laws do not determine the financial loss liability or responsibility. And, Thai banks issue Internet banking agreements or contracts with limited liability. They are not responsible of any loss caused by a malfunction in the online banking service or by the customer’s misuse of the service, such as losses resulted from malware and hacking attacks, and security breach of the bank’s website or network (Rotchanakitumnua & Speece, 2003). Therefore, banks should compel governments to build
and design Internet banking laws and regulations to be able to gain their customers’ trust as well as more IB adopters.

Building trust is very important for web vendors to persuade first-time consumers to transact with them. Therefore, banks must build trust by providing and maintaining secured services, which can be achieved by securing their websites and the Internet environment in general to overcome potential customers’ uncertainty, and perceived risk of having personal information stolen by hackers (McKnight, et al, 2002). Therefore, this paper argues that once bank customers start using plastic cards for their purchases, then it is most probably that they will accept to take the risk of using IB to supervise their plastic cards transactions and reduce the risk of the electronic payments.

Plastic Cards

Credit cards were first introduced in Britain in 1966, however debit cards were introduced in 1987. Since then, when consumers adopt credit and debit cards, they basically are replacing cash and cheques by plastic cards as a mean of payment (Szmigin & Bourne, 1999).

The reason behind using credit and debit cards instead of cash and cheques is for the mutual benefit of banks and their customers. Using plastic cards instead of cheques reduces banks’ transaction costs because electronic payment methods cost 50 to 65 percent less than paying with cheques (Humphrey, et al., 2000). On the other hand, consumers who want to shop through the Internet from exclusive sites can only pay using their credit or debit cards (Eastin, 2002). Thus, plastic cards give consumers the opportunity to purchase products and services 24/7 from any place in the world.

Figure1. Consecutive adoptions of payment systems (Antonides, et al., 1999)

Antonides, et al. (1999) found that the usage of a previously introduced payment system affects the adoption of a system innovation. As Figure 1 shows, credit card use influenced the adoption of ATM use, which in turn influenced the adoption of banker’s card use (e.g., debit card). Based on Antonides, et al. (1999) findings, this paper extends the model in Figure 1 to suggest that credit and debit card use influences IB use.

This paper argues that diffusing plastic card use is an important part of IB marketing process. A main factor influencing plastic cards adoption by consumer is its previous acceptance and adoption by merchants and billers. For example, housing rents are the least bills type that are paid by credit and debit cards because such payments methods are unaccepted by landlords (Hayashi and Klee, 2003).

TAM and Diffusion of Innovation

This paper is using TAM model to explain the usefulness factor of IB. The perceived usefulness of a technology product or service is the degree to which a potential adopter trust that by using it
will improve his/her job performance (Davis, 1989). Thus, in the case of Internet banking adoption, perceived usefulness is measured by the degree the customers believe that IB is more advantageous compared to traditional banking (Chong, et al., 2010). Furthermore, this paper is adding plastic cards monitoring as a new usefulness factor in IB use because it helps improving consumers spending performance when using plastic cards. Reviewing credit and debit cards purchase transaction using IB helps consumers avoid overcharge payments or hidden fees payments that they never agreed on paying them, which happens in online purchases. This paper argues that IB usefulness for consumers who use plastic cards is higher than the IB usefulness for consumers who do not. Consumers who do not use plastic cards would use IB for convenience because those consumers can always bank efficiently using phone or ATM. They can check their balance using the automated service available on the phone, or using ATM machines that are available in hundreds almost everywhere. Also, they can transfer money from a checking account to a saving account or vice versa using the ATM. However, these options are not helpful for consumers who use credit and debit cards. The ATM machine would not provide consumers with a detailed statement that include all purchases made by the card. Same case when using the phone automated service. The authors of this paper investigated the phone automated service options with regard of revising cards purchases. After calling the automated phone service of several top credit and debit cards' providers, the authors were able to revise the last five purchases made. Thus, a consumer who uses plastic cards as a main payment method will not be able to revise the purchases unless if he/she wants to do that on a daily bases and spend over ten minutes on the phone every day listening to a machine. Also, these information do not include the name of the merchant neither its location, it only includes the type of the merchant such as department store and restaurant. Therefore, if a consumer has a second card for his wife will never be able to tell his purchases from hers. To summarize all this, using IB for plastic cards users is easier, faster, and more effective and informational than using traditional methods such as phone or ATM.

Using the diffusion of innovation theory, Hayashi and Klee (2003) found that in the context of electronic payments adoption, the tendency to adopt one new technology is correlated with the tendency to adopt another new technology. Specifically, they found that consumers who use new technologies are more likely to use electronic forms of payment (e.g., credit and debit cards). Therefore, this paper argues that based on the diffusion of innovation theory, consumers who adopt electronic forms of payment are more likely to use Internet banking.

**RESEARCH MODEL**

Based on the literature review as well as the statement of problem presented in the previous sections of this paper, the research model in Figure 2 is suggested to answer our research question. This paper suggests nine hypotheses:

- \( H_{1a} \): Consumer’s perceived usefulness has a positive effect on IB adoption and use
- \( H_{1b} \): Consumer’s perceived usefulness has a positive effect on PPC adoption and use
- \( H_{2a} \): Consumer’s perceived ease of use has a positive effect on IB adoption and use
- \( H_{2b} \): Consumer’s perceived ease of use has a positive effect on PPC adoption and use
- \( H_{3a} \): Legal support has a positive effect on IB adoption and use
- \( H_{3b} \): Legal support has a positive effect on PPC adoption and use
- \( H_{4a} \): Trust has a positive effect on IB adoption and use
- \( H_{4b} \): Trust has a positive effect on PPC adoption and use
- \( H_{5} \): Plastic payment card use has a positive mediating effect on IB adoption and use
METHODOLOGY

This paper will generate its data using a web survey questionnaire. This survey will be published using electronic invitation through Hotmail and Facebook. The targeted sample of this study is from two developed countries, the US and Germany, and two developing countries, Lebanon and Thailand. The survey questionnaire is divided to two sections. The first one includes demographic questions, while the second one includes two clusters of questions - the first cluster questions retrieve the level of plastic payment cards (PPC) use by the sample, and the second cluster questions retrieve the level of IB use by the sample.

The statistical techniques used in this study are descriptive statistics, exploratory factor analysis, and structure equation model.

IMPLICATIONS

The findings of this study would definitely have a huge contribution toward research and practice. This study draws attention to the influence or effect of plastic payment card use on Internet banking adoption and use. This is the first study that ever addresses such connection among these two technologies. Definitely, the “Internet banking adoption” literature is becoming richer and more relevant to practice by investigating such a relationship.

Previous literature have been investigating the phenomenon of Internet banking adoption for the last 15 years and still when looking to the practical side, the rates of IB adoption are still disappointing even in some developed countries. The findings of this study will be so much valuable to bank managers and IB marketers in every single country in the world. Such findings would contribute into creating a new path of marketing for IB. The relationship that relates PPC to IB will be used to mitigate the uncertainty of the potential IB adopters, especially the ones who have concerns about security and lacks trust in the IB system. Succeeding drawing this relationship will contribute into drawing a new and combined marketing strategy for both PPC and IB technologies. This is a win-win marketing strategy that would decrease banks’
operational and administrative cost, and increase the profits of for both banks and plastic payment cards providers.

Previously, developing countries such as Vietnam and Thailand found many barriers and difficulties to make IB trustworthy because of the lack of legal support as well as technology infrastructure. Technology infrastructure is very costly to build and most likely poor countries will not be able to afford it. However, legal support is easy to provide by creating e-commerce/e-banking laws and regulations, and even poor countries would afford such projects. Thus, after solving the easier “legal support” problem this study presents the best alternative to overcome the technology infrastructure problems. Plastic purchase cards do not need the advanced technology infrastructure because using them only require a land phone line, which is almost available everywhere in developed and developing countries. Therefore, making consumers cashless would lead them to use IB to be able to monitor and supervise their purchase activities. To make them cashless, simply providing incentives for using PPC such as cash back and insurance on products purchased will do it.

LIMITATIONS

The optimal way to investigate the research question of this paper is by applying longitudinal or time series data analysis methodologies. Time series statistical tools are valid and reliable to clarify the type of relationship between PPC and IB. Their statistical powers can distinguish between two types of relationships represented by the cause-effect relationship and the correlation over time relationship. However, individual level data are almost impossible to be generated as time series annual data. The longitudinal data that is valid for this study would be the cross-country data (country level). Unfortunately, such data is not available.

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