Internet Banking Internationally and in

Greece. The Determinants of its Adoption.

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This project is co-funded by the European Social Fund and national resources

Abstract

Internet banking is a distribution channel, which is increasingly being adopted by bank customers worldwide. However, this channel has not yet been exploited by Greek bank customers as could have been. Greeks, together with other nations, have been rather laggard in adopting it as well as in using other innovations, such as the Internet, which is unbreakably connected with the use of Internet banking. Nevertheless, there are positive future prospects regarding the adoption of Internet banking, even in countries like Greece.

The topic of Internet banking is gaining more and more the interest of researchers worldwide. In their effort to understand what affects the adoption of Internet banking, they have applied a large range of models in different countries and environments. A widely accepted model that has been proved to be facilitating research on adoption of Information Technology is Davis's Technology Acceptance Model (TAM). TAM has been extensively applied in the context of Internet banking, either in its primary or in modified forms. A modified TAM is suggested in the present work too, as a tool to examine the adoption of Internet banking. More specifically, the proposed tool examines the direct or indirect influence of constructs of the original TAM, such as "perceived usefulness" and "perceived ease of use", along with that of later additions to the model (i.e. "perceived credibility") or other contributive constructs (e.g. "innovativeness", "satisfaction with banking channels"), on the bank customers' intentions towards the use of Internet banking.

This model has been developed aiming to facilitate the investigation of web-experienced bank customers' intentions to adopt Internet banking.

Keywords: Internet banking, adoption, TAM

INTRODUCTION

Networked information systems and the infrastructure from which they depend materialise the format and the operational form of organiational, political and social life as well as the expression of cultural values on which they depend (Blanas, 2003). According to Shih and Fang (2006), Internet banking is "a new type of information system that uses emerging techniques, such as the Internet and the World Wide Web, and has changed how customers perform various financial activities in virtual space". This term is quite frequently and mistakenly being used interchangeably with that of e-banking (Aggelis, 2004,p.26; Karjaluoto et al, 2002), which however represents a "higher-level activity" (Cheng et al, 2006). Despite the interest in the supply-side (i.e. banks), both worldwide and in Greece, to offer their services via the web, Internet technology when

combined with financial services produces a mixture with a quite unpredictable level of perceptibility by the consumers (Eriksson et al, 2005). For this reason, there is a rising interest by researchers all over the world to study the use of Internet banking as well as the factors that lead to its adoption (e.g. Karjaluoto et al, 2002; Shih and Fang, 2006). Many representatives of this stream of research have based their studies on the Technology Acceptance Model (TAM), or even have modified it and combined it with other models in order to examine Internet banking acceptance (e.g. Wang et al, 2003; Kolodinsky et al, 2004).

The present work reviews Internet banking related issues and describes the steps towards the development of a modified version of TAM that fits Internet banking and explains what factors determine Internet-literate bank customers' intentions to adopt online banking.

LITERATURE REVIEW

INTERNET BANKING: THE SUPPLY-SIDE (BANKS)

Worldwide and in Greece

Under the fear of becoming "dinosaurs" soon to be extinct, as Bill Gates had alerted (Epper and Kutler, 1995), banks had to adjust themselves to the new technological environment that the advent of Internet had created for them. They actually did so. According to Simpson (2002), the level of banks' acceptance of Internet banking in developed as well as in emerging markets promises, if not secures, a positive future in terms of customers' adoption of this new banking channel.

Focusing on the Greek market, Internet banking was introduced in 1997 offering a minimum of services, mostly informational (Aggelis, 2005,p.53). Since then, the number of services has increased significantly (E-Business Forum, 2004). Today, 11 out of the 25 Greek and 5 out of the 20 foreign credit institutions that compose the Greek banking industry, have built sites offering Internet banking services (Hellenic Bank Association, 2006a; Aggelis, 2005,p.54). These sites are fully competitive those in other countries and year after year they generate improved turnovers (Aggelis, 2005, p.25;Go-online Programme, 2004).

Benefits and Drawbacks of Internet Banking

The reason that entices banks to create sites for banking transactions is the possibility of attaining a wide range of benefits. Such **benefits**, according to Esser (1999) are to achieve:

- competitive advantage,
- growth in revenues,
- new customers' attraction and retention of the old ones and
- cut in costs (see Appendix, Figure 1) [especially transaction and staff costs (Simpson, 2002)].

On the other hand, there are still banks resisting to the Internet banking potential, due to **drawbacks** like the fear of the "electronic crime", which is linked to continuous expenses in order to evade it ⁽Go-Online Programme, 2002). Furthermore, bank managers might also be held back by the amount of money that is necessary to create an online brand (Simpson, 2002).

According to Evans and Wurster (1997), Internet banking is definitely going to cause turbulence to the entire banking sector (not only to the ones that adopt it) by:

- lowering the switching barriers,
- impeding cross-selling and customer-information selection and
- leading to a competition based in product comparisons.

Thus, it seems that even if a bank has not already established an online banking distribution channel, sooner or later it will have to do so. As Mols (1998) states, the environment created by both Internet's advent and its influence on customers is likely to eventually force banks to adapt their distribution channels. Therefore, an early reaction to the seemingly inevitable prevalence of Internet banking might help in building and establishing an online brand before having to do so.

INTERNET BANKING: THE DEMAND-SIDE (CUSTOMERS)

Worldwide and in Greece

Northern European countries are the leaders in Internet banking penetration, demonstrating an impressive penetration difference between them and e.g. U.S.A., where Internet banking was firstly introduced (see Appendix, Figure 2). On the contrary, Mediterranean countries (e.g. Spain, Portugal) are laggards in both Internet and online banking penetration.

In Greece, that is also a Southern European country, a research conducted for "The National Network Of Research And Technology" in 2005 (E-Business Forum, 2005) proved that the use of Internet for banking transactions is one of the less important reasons for Greeks to use the Internet. The "Observatory for the Information Society" (2005) launched a similar survey and its results are in line with the aforementioned (see Appendix, Figure 3). More specifically, this survey showed that 13% of the Internet users adopt Internet banking.

Despite these frustrating observations, positive signs for the future adoption rates of Internet banking in Greece do exist. A survey (AGB Nielsen Media Research, 2005), which was conducted in a sample of Internet users, illustrated a growth of 2,4% in the percentage of Internet banking users in a year's time (see Appendix, Figure 4), and this possibly constitutes a good omen for future adoption rates.

Benefits and Drawbacks of Internet Banking

According to the Hellenic Bank Association (2006b), Internet banking is perceived to be **beneficial** to its users mainly because it offers "round the clock" access to bank services, doesn't take time, offers access from anywhere there is a PC with an Internet connection, has lower costs, is easy to be used and eliminates the anxiety caused when we carry money. Internet banking also allows rapid responses to customers' complaints along with better kinds of services (Shih and Fang, 2006). As it is obvious, the convenience offered by this new banking channel is substantial.

However, there are some features of the Internet banking systems that might be considered as *drawbacks*. One such drawback can be the not yet well-established security of online payments¹ (Go-Online Programme, 2002). The lack of interaction with employees can also be a drawback for

¹ There are several well-known cases of "electronic attacks" at big banks (e.g. Citibank-1994, Barklays Bank-2000) (Go-Online Programme, 2002) that might have resulted to customers' feeling of insecurity regarding online payments.

people who value this interaction highly, as Dabholkar and Baggozzi (2002) observed in the context of technology-based self-service. Finally, an important drawback of Internet banking for many people is that it applies to a "niche" market of "computer-literate persons" (Mols, 1998) and not to everyone, like branch banking for example.

MODELS FOR EVALUATING ADOPTION

As Vrechopoulos et al (2001) stated: "adoption implies that consumers have accepted the (product or technology) innovation and use it on a regular basis".Research on adoption in the field of Information Technology (IT) has resulted in the formulation of many models, which seek to discover its determinants (Venkatesh et al, 2003).The prevailing models are the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB), a Combination of TAM and TPB, the Motivational Model, a model of PC utilization, the Innovation Diffusion Theory and the Social Cognitive Theory (Venkatesh et al, 2003).

TAM, according to Singh et al (2006) "has been one of the most influential theories in the IT literature", while McKechnie et al (2006) underline its appropriateness in examining IT and Information Systems' (IS) acceptance. Internet banking, as an Internet-based IS (Suh and Han, 2002), has recently drawn the attention of IS researchers and made them focus on the examination of its adoption via the use of TAM (e.g. Cheng et al, 2006; Suh and Han, 2002) rather than the other previously cited models. Such an observation encourages the use of TAM as a basis for this work and necessitates its further presentation that follows.

Technology Acceptance Model (TAM)

Davis (1986, cited by Davis et al, 1989) developed TAM in order to offer an explanation for computer usage behaviour. His work constituted a development of Fishbein and Ajzen's TRA (1975). At this point, it is important to quote some basic definitions of core TRA's constructs, which are either met also in TAM (i.e. intentions and attitudes) or are considered to be important for the present review's purposes:

- <u>Behavioural Intention</u>, according to Fishbein and Ajzen (1975) is measuring the strength of a person's intention to behave in a specific way.
- <u>Attitude</u> is "an individual's positive and negative feelings about performing the target behaviour" (Fishbein and Ajzen, 1975) and
- Subjective norms are "the person's perception that most people who are important to him think he should not perform the behaviour in question" (Fishbein and Ajzen, 1975). These norms are thought to be an important omission of the original TAM, in comparison to TRA (Shih and Fang, 2006). This omission however does not significantly affect the adoption evaluation process, in cases where the adoption of the specific technology is not mandatory (Venkatesh et al, 2003).

TAM (see Appendix, Figure 5), according to Venkatesh et al (2003), laid the foundation for research on the adoption of IS. It proposed two beliefs as (direct or indirect) intentions' determinants (Venkatesh and Davis, 2000): <u>Perceived Usefulness</u> (PU), which is "the degree to which a person believes that using a particular system would enhance his performance" and <u>Perceived Ease of Use</u> (PEOU), which is "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989). PU, as a construct, bears similarities with factors met in other models, such as the "extrinsic motivation" of the

Motivational Model, the "relative advantage" of the Innovation Diffusion Theory and others (Venkatesh et al, 2003). The same happens with PEOU, which for example is similar to the construct of "ease of use" that is met in the Innovation Diffusion Theory (Venkatesh et al, 2003).Within the context of TAM, PU and PEOU are directly affected by external variables, such as system features and user characteristics (Davis et al, 1989). PU influences directly intentions and attitudes, while PEOU acts upon PU and attitudes (Davis, 1989). Finally TAM, just like TRA, accepts the sequential connection between attitude, intention and behaviour. However, in TAM's history of modifications and simplifications, many researchers have used intentions rather than the actual behaviour as the dependent variable (e.g. Wang et al, 2003; Cheng et al, 2006). The reason for this has been intention's suitability, as a dependent variable, for research based in surveys (Agarwal and Prasad, 1999). Such an observation, along with this construct's practicality in cases of low Internet banking penetration (Cheng et al, 2006), supports the worthiness of the present work's focus on intentions rather than on actual adoption.

Davis, participated recently in a study, which led to the formation of TAM2 (Venkatesh and Davis, 2000). In this model, since parsimony is considered as an important characteristic that every model must have (Sundarraj and Wu, 2005), the attitude construct was excluded (Venkatesh et al, 2003). This exclusion is therefore adopted in the present project too. TAM2 also encompassed some social influence and cognitive instrumental processes, which however are irrelevant to a voluntary usage environment (Venkatesh and Davis, 2000), such as that of online banking adoption by individuals that is the case of this work.

Except for the researchers' interest on modifying TAM, different streams of research focused, according to Venkatesh et al (2003), on applying it to several computer systems and technologies, such as e-mail, word processors and others (Cheng et al, 2006), as well as to various groups of users, such as individuals (e.g. Lymperopoulos and Chaniotakis, 2005) and enterprises (e.g.Technological Observatory, 2002), in order to predict IT/IS adoption. Through the years that it has been applied as a research framework, TAM has gained, according to Venkatesh and Davis (2000), the right to be characterized as a "robust, powerful and parsimonious model for predicting user acceptance". Opposing to this recognition, there has been criticism mainly focusing on the omission of the social influence factor (Moon and Kim, 2001), which however is out of this work's scope, and the so far inconsistent results regarding the effect of the PEOU construct (Shih, 2004).

The so far reviewed literature has led to a first step in this work's model development, which is a simplified version of TAM (for its schematic presentation, see Appendix, Figure 6).

DETERMINANTS OF INTENTIONS TO ADOPT INTERNET BANKING

During the past six years there has been an increasing interest of researchers (e.g. Wan et al, 2005; Sadiq Sohail and Shanmugham, 2003) in examining the mechanism of Internet banking adoption. These researchers' findings, TAM-based or not, will be presented in this chapter.

Non TAM-Based Research

In a project that took place in Hong Kong (Wan et al, 2005), bank marketing literature and interviews revealed the basic attributes that could possibly influence Internet banking adoption. The findings were incorporated in a questionnaire-based research, which indicated as basic determinants of Internet banking adoption, its informative character, its "friendly to the user" nature and the security and accuracy of transactions. The bank customers of Hong Kong, according to Wan et al (2005), proved to be quite knowledgeable of the convenience associated with Internet banking usage. Those who used it were mostly middle-aged, with moderate income and educational levels and high cost appointed to the time they spared. When compared to branch customers, Internet banking users were quite younger, wealthier and more educated.

In line with the aforementioned survey, Sadiq Sohail and Shanmugham (2003) observed that Internet banking users in Malaysia had significantly higher monthly incomes than the users of the conventional distribution channels. However, the research of Sadiq Sohail and Shanmugham (2003) discovered that there is no important difference in the age or education level of Internet banking users and conventional bank customers. They also found that Malaysians valued convenience as an important factor that affects their adoption decision. Factors like Internet accessibility, security and willingness or not to change were also saliently influential to adoption. These last considerations are keeping up with the results of Eastin's (2002) recent research in the United States, on the diffusion of four e-commerce activities, which indicated perceptions about convenience and risk as the most important determinants of Internet banking acceptance.

In a survey, conducted also in the United States (Kolodinsky et al, 2004), an extension of Rogers' (1962) Innovation Diffusion Theory was applied in order to examine consumers' adoption of e-banking. Internet banking acceptance was highly influenced by perceptions about its relative advantage, compatibility, simplicity and risk, a finding also confirmed by Eastin (2002), while involvement with other types of e-banking (e.g. ATMs) proved to be a good predictor of Internet banking adoption too. Internet banking users in the U.S., were mostly up to 35 years old, with college education and income growth rate higher than the rise in prices.

The research of Howcroft et al (2002) in the United Kingdom, that was also drawing on Innovation Diffusion Theory, revealed the importance of cost, concerns about security, fear of errors and level of service, to Internet banking adoption, in contrast to the minor influence of friends, family or press recommendations. The "18 to 25" age group was the one that mostly preferred the Internet as the medium for their banking transactions.

Summarising these non TAM-based researches' results, perceived security and convenience seem to be the prevailing determinants of Internet banking adoption, while early age stages and good education and income levels appear to be fulfilling Internet banking adopters' profile.

TAM-Based Research

The following review of TAM-based research is divided into sections according to the constructs on which, each one is focused on.

<u>PU and PEOU</u>

Sundarraj and Wu (2005) conducted a survey by employing a simplified version of TAM that omitted the "attitudes" and "intentions" constructs. They found out that graduates outperformed undergraduates in positive perceptions, regarding the usefulness and ease of use of Internet banking, and also offered a confirmation of the aforementioned perceptions' validity in the online banking context.

Erriksson et al (2005), in a study that was based on a simplified version of TAM similar to that employed in the previously mentioned research, commended the value of PU as a motivational factor and questioned the direct influence of PEOU to actual usage.

Pikkarainen et al (2004) added their confirmation in the wide acceptance of PU as a determinant of adoption. They also argued, in line with the outcome of the research of Errikson et al (2005), that PEOU has less of a direct effect on acceptance than PU. Pikkarainen et al (2004) explained this by the fact that the more information a customer has on the ease of use of Internet banking, the more PEOU affects the PU construct and indirectly the acceptance. Moreover, they suggested that when information about online banking is available on the bank's website, there is more motivation and greater likelihood for actual use of online banking.

Due to the importance appointed to PU as a predictor of online banking acceptance, Liao and Cheung (2002) tried to specify its major attributes in the context of online retail banking. Perceived security, accuracy, user-friendliness and user involvement were indicated by the outcome of their research on a sample of Internet banking users, as the most prominent attributes encompassed under the wide construct of PU. A similarity between these attributes and the determinants of online banking acceptance identified by some of the formerly cited non TAM-based researches (e.g. Wan et al, 2005), enhances their importance to adoption.

Overall, the belief constructs of TAM (i.e. PU and PEOU) can be characterised as the model's more stably used and accepted constructs.

Security, Trust and Credibility

Trust, according to the definition of Doney and Cannon (1997), is "the perceived credibility and benevolence of a target of trust". Perceived credibility is "the extend to which one partner believes that the other partner has the required expertise to perform the job effectively and reliably" (Ganesan, 1994) and includes the concepts of privacy and security. Benevolence on the other hand refers to a relationship between two partners, where there is a mutual interest on the other's welfare even in cases when there is not any commitment to do so (Wang et al, 2003).

In several of the TAM-based research efforts on the adoption of Internet banking, either trust (e.g. Suh and Han, 2002) or one of its sub-dimensions (perceived credibility, perceived security etc.) (e.g. Liao and Cheung, 2002) has been applied as an addition to the original TAM. These additional constructs' definition as well as their placement in TAM, varies as the following research cases illustrate.

Perceived security has not only been identified as an attribute of PU (e.g. Liao and Cheung, 2002), but has also been tested as a segregated belief by Cheng et al (2006). Specifically, they found that Perceived Web Security, which is defined as "the extend to which one believes that the World Wide Web is secure for transmitting information" (Salisbury et al, 2001), had a positive influence on their survey's dependent variable, which was the construct of intentions to accept online banking.

The multidimensional higher construct of trust (Pikkarainen et al, 2004) has also been applied in the context of TAM and Internet banking. The effect of trust, in the frames of TAM and Internet banking, was examined by Suh and Han (2002), who viewed trust as a *belief* that was significantly influenced by perceptions about usefulness and, at the same time, directly affected attitudes in a stronger way than that of PEOU.

A survey of Wang et al (2003) in Taiwan, which was based on interviews of both Internet banking users and non-users, used perceived credibility as a belief that partly contributes to the formation of customers' trust, is affected by PEOU and determines intentions. The reason that Wang et al (2003) did not use trust, as Suh and Han (2002) did, was that they were interested in both users and non-users of online banking. According to these researchers, since trust includes also the dimension of benevolence, which would require "familiarity and prior interaction" with Internet banking from the respondents, it was deemed inapplicable. The aforementioned covers the present work's interests too.

In a recent research of Eriksson et al (2005) among Estonian Internet banking users, TAM was used in a simplified form that excluded the "attitudes" and "intentions" constructs, which, in contrary to the work of Suh and Han (2002), theorised trust as an *external variable* and confirmed its positive act on TAM's two belief constructs. Eriksson et al (2005) viewed trust as "an apprehension of the bank's trustworthiness which arises from the bank's expertise and reliability". Thereby, based on the definition of perceived credibility by Doney and Canon (1997), someone can come to the conclusion that the construct that Eriksson et al (2005) used was perceived credibility rather than trust. Hence, Eriksson et al (2005) have added to the identified by Wang et al (2003) interactions of perceived credibility with TAM's beliefs, its relationship with PU.

The prior review of trust and its sub-dimensions, along with the first step in the development of this work's model, was the input to the second-step in the model development process (see Appendix, Figure 7).

External Variables

In the stream of TAM-based studies in Internet banking adoption, some researchers (e.g. Lassar et al, 2005) have concentrated on the examination of the effect of consumer experiences and traits in the usage of Internet banking.

Specifically, a web-survey in the United States (Lassar et al, 2005) concluded in the salience of factors, such as opinion leadership in Internet-related subjects, intensity of Internet use and a utilitarian (rather than hedonistic) view of Internet, in predicting adoption. The importance of the intensity of Internet use was also confirmed in a Finnish study (Karjaluoto et al, 2002). The consent over the salience of web usage intensity as an external variable of TAM, led to its inclusion in this work's model.

Another factor that also showed up in the work of Lassar et al (2005) was opinion leadership, which represented a measure of domain specific innovativeness. Domain specific innovativeness is a reflection of "the tendency to learn about and adopt innovations within a specific domain of interest" (Goldsmith and Hofacker, 1991), which in the case of online banking is the Internet. On the other hand, general innovativeness, which in the work of Lassar et al (2005) was surprisingly found to be negatively influencing Internet banking adoption, is "the degree to which an individual is receptive to new ideas" (Chang et al, 2005). General Innovativeness has received both good and bad results as a determinant of intention to shop online (Chang et al, 2005; Citrin et al, 2000), whilst innovativeness in the domain of IT has been found to be influencing the perceptions regarding the specific technology's usefulness (Agarwall and Prasad, 1998). These observations along with the findings of Lassar et al (2005), led to the incorporation of the more consistent of the two kinds of innovativeness, which is the domain specific innovativeness in this work's model.

Aside from web usage intensity and innovativeness, McKechnie et al (2006) accentuated the influence of external variables, like internet accessibility from home, product category involvement and former e-shopping experience, on PU and PEOU of online financial services. The variable of prior e-shopping experience is also included in this project's model, because of both the observations of McKechnie et al (2006) and the slightly better rates of e-shopping adoption in Greece than those of online banking (E-Business Forum, 2005). It is believed that these rates might indicate a group of bank customers who are familiar with monetary transactions via the web and might not have yet the urge needed to use Internet banking.

The review on external variables of TAM, has led to the third step in the development of the final model (see Appendix, Figure 8).

Other proposed variables: Satisfaction

Internet banking has a dual nature, as an Internet-based information system (Shih and Fang, 2006) and an alternative, and consequently substitute to others, banking channel (Lymperopoulos, 1994, p.263). This fact has triggered the inclusion of satisfaction, regarding both the medium via which online banking is offered and the other banking channels, in this work's model. This inclusion will be further justified in the following sub-sections.

Satisfaction with the Internet

Shih (2004) studied the determinants of e-shopping acceptance in web-experienced office workers and confirmed the effect of the overall satisfaction with the Internet on PEOU and PU. Since e-shopping and Internet are both e-commerce activities (Eastin, 2002), there could be a similar effect of satisfaction to the belief constructs of this work's model too.

Satisfaction with Other Banking Channels

"Satisfaction", according to Kotler and Keller (2006, p.144), "is a person's feeling of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectations". Satisfaction is accepted by many researchers as a salient determinant of technology acceptance (Konradt et al, 2006), while it has also been included as a construct of the "Expectation-confirmation theory" that influenced repurchase intentions (Lin et al, 2005). These considerations can lead to the conclusion that, since satisfaction with a product/technology leads to its repurchase/acceptance, dissatisfaction with it might imply the purchase/acceptance of a substitute.

Hence, intentions to use Internet banking could be negatively affected, in a direct or indirect way, by high levels of satisfaction with traditional channels, such as bank branches, which are different to Internet banking from many aspects.

High levels of satisfaction with e-banking channels, such as ATMs, could also affect intentions. This effect however, due to the fact that the aforementioned channels are also "technology-based self-service options" (Prendergast and Marr, 1994), is more likely to be positive. Furthermore, the consideration of prior experience with ATMs as a determinant of Internet banking adoption and attitudes towards it by Karjaluoto et al (2002) reinforces the potential of a positive relationship.

FINAL MODEL

The preceding review has led to this work's proposed model (see Figure A), which derived from the original TAM by:

- excluding TAM's constructs of "attitudes" and "system use", according to researchers' observations (e.g. Wang et al, 2003) and
- adding "perceived credibility" as a determinant of both the dependent variable and PU, according to Wang et al (2003) and Eriksson et al (2005).

Finally, this model encompasses some literature derived (e.g. "Domain Specific Innovativeness") or suggested (i.e. "Satisfaction with Banking Channels") external variables, as determinants of the perception constructs.





FUTURE WORK

The proposed model is going to be tested by the authors via statistical analysis of questionnaires, which will be disseminated to Greek webexperienced bank customers. The questionnaires will be formed according to existing literature and bank managers' suggestions. A pilot study on bank customers will also secure the appropriateness of the questionnaire.

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APPENDIX















Figure 8. Third Step of this Work's Model Development



