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Investigating the Determinants of Internet Banking Adoption in Greece

Ilias Santouridis[a]*, Maria Kyritsi[b]

[a]*Department of Accounting, TEI of Larissa ,41 110, Larissa Greece*
[b] *TEI of Larissa ,41 110, Larissa Greece*

Abstract

Since its first introduction in the '90s, internet banking is increasingly being adopted by bank customers all over the world. This relatively new banking transactions channel offers its users "round the clock" access to bank services, reduced time, direct access from anywhere in the world, lower costs and elimination of the anxiety caused by cash carrying. However, internet banking has not yet been widely embraced by Greek bank customers. In fact Greeks have also been rather slow in adopting internet as well. This reality prompted the pursuance of the present research, whose aim is to identify the most salient factors that influence Greek bank customers regarding internet banking adoption. Field research was conducted by utilizing an interviewer-administered questionnaire. The questionnaire was based on an adaptation of the widely used Technology Acceptance Model (TAM), incorporating also external variables found in relevant literature and was initially successfully pilot-tested by the directors of 3 bank branches and 11 bank customers. The field research target sample consisted of internet experienced bank customers in the Greek region of Thessaly, while the final sample comprised 266 correctly answered questionnaires. Principal component analysis was initially conducted to identify latent factors within the questionnaire items measuring customer perceptions and inter-item analysis was used to verify the scale's factors for internal consistency and reliability. The Cronbach's alpha values, calculated for each construct, ranged between 0.88 and 0.93. Finally, linear regression analysis was performed to investigate the effect of the external variables and TAM-based constructs on internet banking adoption. Data analysis confirmed the significant influence that customer perceptions about usefulness, credibility and easiness of use of internet banking have on intentions towards using this banking channel. Moreover domain specific innovativeness and satisfaction with ATMs were also proved strong predictors of customer use intentions.

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* Corresponding author. Tel.: +30-2410684239; fax: +30-2410613147.
  E-mail address: isant@teilar.gr

1. Introduction

The advent of internet has brought about great capabilities together with radical changes in the way that businesses are conducted. Banks, belonging to an information-intensive industry that is significantly influenced by information technology, have been particularly affected by the internet explosion, since they have been provided with an additional channel to both promote and deliver their services.

Since its first emergence in the mid'90s, internet banking gained a worldwide prominence, translated into a growing number of banks offering a consistently increasing number of services online. However, despite this interest and the resources consumed from banks in their effort to offer advanced services via the web, research has shown that internet technology when combined with financial services can produce mixed feelings and a quite unpredictable level of perceptibility to customers (Eriksson et al, 2005). As a result of this, despite the benefits that internet banking offers to customers, a large proportion of them are still remarkably reluctant in adopting it as a means to perform their daily banking transactions.

The above observation is the main reason behind the rising interest among researchers and practitioners in many countries to study the use of internet banking and the factors that lead to its adoption. In this line, the present research aims at providing an insight into the behavioural intentions and beliefs regarding internet banking in Greece, in order to contribute to the explanation of its currently relatively low penetration rate in this country.

The Technology Acceptance Model (TAM) (Davis et al, 1989) provided the framework for the exploration of both the customers' intentions to adopt internet banking and their determinant factors. TAM is a widely acknowledged instrument for investigating the adoption of Information Systems by their target user communities, which since its first appearance in literature more than 30 years ago, is being continuously applied, modified or combined with other models in many different settings and types of Information Systems.

2. Research Background

2.1. Internet banking

According to Shih and Fang (2006) internet (or online) 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". It has also been described in literature as "an alternative banking distribution channel" (Lymperopoulos, 1994, p.263), which offers "a technology-based self-service option" (Dabholkar et al, 2003) and as one of the services represented by the wider term of "e-banking" (Kolodinsky et al, 2004).

The birth of internet banking can be traced back in 1990, when the first online banking service was offered by the Californian bank Wells Fargo (Aggelis, 2005, p.71). Five years later, the Security First Network Bank, which was also located in USA, boosted the internet banking potential by providing a complete online bank environment (Grandy, 1995). Feeling the danger of becoming technology "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 brought about, in order to face the rapid changes and the high competition that prevails in their sector (Sadiq-Sohail and Shanmugham, 2003). As a result of this, today most banks in developed as well as in emerging markets offer most of their financial and informational services to their customers also through the internet banking channel. It must be noted that in the early years of internet banking development, a trend of establishing "pure-play e-banks", which are banks with no "brick-and-mortar facilities" delivering their services exclusively via electronic means, was evidenced (Lassar et al, 2005). However, this trend soon declined in favour of the currently prevailing strategy of a "clicks and bricks" approach (Pennathur, 2001). This contemporary strategy views internet banking as a complementary service to the traditional and already established ones, aiming at the addition of a new weapon in the banks' arsenal, that will help them confront the new rapid changes and the intense international competition (Sadiq-Sohail and Shanmugham, 2003).

Focusing on the Greek market, internet banking was introduced in 1997 offering a very small range of mostly informational services (Aggelis, 2005, p.53). Since then, the range of services provided by banks via the internet in Greece is being constantly widened and now the internet banking user can do financial transactions like payments

(e.g. bills, credit cards) or sending remittances, be provided with information (e.g. account balance) and manage stock market accounts. Today, most of the Greek and foreign credit institutions that compose the Greek banking industry, own websites, which offer highly competitive banking services to their customers and generate yearly increasing turnovers.

According to Esser (1999), banks are enticed to develop, maintain and enhance internet banking services in order to achieve a competitive advantage that will help them stand out in the highly competitive banking environment, maintain growth in revenues, gain attraction of new customers and retention of the old ones and achieve significant cuts in transaction and staff costs.

At the same time, internet banking is perceived by customers to be beneficial mainly because it offers "round the clock" access to bank services, savings in time, access from anywhere there is an appliance with internet connection, lower costs, ease of use and elimination of the anxiety caused when carrying money (Hellenic Bank Association, 2013). Internet banking also supports rapid responses to customers' complaints along with higher quality of services (Shih and Fang, 2006). However, customers also express concerns mainly stemming from transaction security related issues. Moreover, as Dabholkar and Baggozzi (2002) pointed out, some people value highly their interaction with employees and therefore consider the lack of interaction imposed by internet banking, as an important drawback.

2.2. Internet and Internet banking penetration rates in Greece

Lassar et al. (2005) have shown that it is more likely for individuals with web experience to adopt internet banking. Thereby, it is critical to examine the internet penetration rates in Greece, where the present research took place.

The development of services provided over the internet in Greece is well below the European Union (EU) average. Up to a certain degree, this backwardness can be attributed to the relatively low penetration rate of internet in Greece. According to a survey by EUROSTAT (2012a), only 51% of the Greek households have internet connection, a figure well below the 72% EU average, which places Greece among the 3 countries with the lowest rate among the 27 EU member states. Even those who do go online mostly restrict themselves to using the web for communication, entertainment and information seeking purposes, since only 20% of Greeks purchase goods or services over the internet, while the EU average is 44% (EUROSTAT, 2012b). At the same time, internet services offered by banks are accessed by only 9% of Greeks, with the EU average being at 38% (EUROSTAT, 2012c).

The figures mentioned above accentuate the need for research on the factors influencing internet banking adoption in Greece. Such information would provide bank managers with a valuable insight into the reasons behind the low rates of internet banking adoption and would be utilized in developing strategies for ameliorating this situation.

2.3. Information technology adoption

During the past few decades, the widely acknowledged importance of IT adoption led to many attempts made by researchers and practitioners, aiming at discovering its determinants. This effort resulted in the development of models and theories such as the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB), a comprehensive review of which can be found in the work of Venkatesh et al (2003).

There is a little doubt that among the IT adoption models reported in literature, TAM has been proved to be the most popular as can been deduced by the numerous research efforts that utilized it in many different countries and IT settings. Singh et al (2006) stressed out that "TAM has been one of the most influential theories in the IT literature", while McKechnie et al. (2006) underlined its appropriateness in examining IS acceptance by users. Through the years that TAM has been applied as a framework for research, it has gained the right to be characterized as a robust, powerful and parsimonious model for predicting user acceptance (Venkatesh and Davis, 2000).

TAM (Figure 1) was presented by Davis et al (1989), who aimed at developing a model that will be used to explain computer usage behaviour. They built on the work of Fishbein and Ajzen (1975) on TRA, who support that

beliefs determine attitude, attitude and subjective norms influence behavioural intentions, which in their turn affect behaviour.
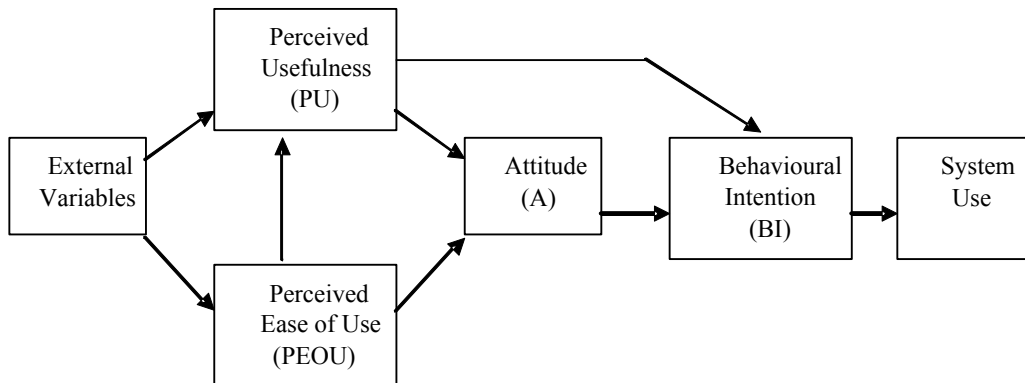

Fig. 1. Technology Acceptance Model (Davis et al, 1989)

TAM adopts the basic TRA constructs of Behavioural Intention (BI) and Attitude, which are defined as "the strength of a person's intention to behave in a specific way" and "an individual's positive and negative feelings about performing the target behaviour" respectively (Fishbein and Ajzen, 1975).

In addition to the above, TAM includes two beliefs as direct or indirect intentions' determinants namely *Perceived Usefulness* (PU), which is "the degree to which a person believes that using a particular system would enhance his performance" and *Perceived Ease of Use* (PEOU), which is "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989). PU influences directly intentions and attitudes, while PEOU acts upon PU and attitude. Moreover, PU and PEOU are directly affected by external variables, such as system features and user characteristics.

Finally, just like TRA, TAM accepts the sequential connection between attitude, intention and behavior.

3. Research Model Development

3.1. TAM constructs

As it has already been pointed out TAM provided the framework of the research presented here. However the model was adapted so that it better fits the context in which the research took place. More specifically, the following design decisions were made:

- The research model includes the *PU*, *PEOU* and *BI* constructs.
- *System use* has been omitted. Many researchers have used intentions rather than the actual behaviour as the final construct (e.g. Cheng et al, 2006; Wang et al, 2003) for several reasons. The decision of focusing on BI in this research was made based on the fact that the low internet banking penetration rate in Greece would pose significant limits on the number of possible survey respondents.
- *Attitude* has been omitted. This decision was influenced by the construct's omission from TAM 2 (Venkatesh and Davis, 2000), the model resulted from the evolution of TAM.

3.2. Perceived Credibility

Perceived credibility (PCR) has been defined by Ganesan (1994) as "the extent to which one partner believes that the other partner has the required expertise to perform the job effectively and reliably" and includes the concepts of privacy and security. Therefore, it is very likely that PCR plays a significant role in determining the adoption of

internet banking, a transactions channel connected with serious uncertainty regarding the privacy and security provisions it ensures to its users. This issue can emerge more emphatically in populations whose members are largely not familiar with performing any kind of transaction over the internet, such as the Greeks.

Perceived credibility has been linked with TAM-based research efforts investigating the adoption of internet banking in various forms. Liao and Cheung (2002) identified perceived security, which is a PCR dimension, as an attribute of PU, while Cheng et al (2006) tested it as a distinct additional belief and found that it affects BI. Wang et al (2003) used PCR as a belief that partly contributes to the formation of the higher construct of trust and determines BI. In a similar line, Suh and Han (2002) found that PCR, as a dimension of trust, affects attitude, while Eriksson et al (2005) used trust as an external variable.

3.3. External variables

Customer experiences and traits

In the stream of TAM-based studies in internet banking adoption, several researchers concentrated on the examination of the effect of consumer experiences and traits in the adoption of internet banking.

Karjaluoto et al (2002) and Lassar et al (2005) confirmed the influence of *internet usage intensity* on internet banking adoption, while the work of McKechnie et al (2006) highlighted the impact of *prior e-shopping experience*.

Another factor that also showed up in the work of Lassar et al (2005) was opinion leadership, which represents 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 internet banking is the internet. Furthermore, innovativeness in the domain of IT has been also found to influence PU (Agarwall and Prasad, 1998).

Satisfaction

Satisfaction, as Konradt et al (2006) have stated, is accepted by many researchers as a salient determinant of technology acceptance, while it has also been included as a construct of the "Expectation-confirmation theory" that influences repurchasing intentions (Lin et al, 2005). These considerations can lead to the assumption that, since satisfaction with a product/technology leads to its repurchase/acceptance, dissatisfaction may lead to the purchase/acceptance of a substitute. Hence, intentions to use internet banking could be negatively affected by a high level of satisfaction with the traditional channel i.e. the "brick and mortar" bank branches.

Moreover, a high level of satisfaction with other IT-based banking channels, such as the Automatic Teller Machines (ATM), could also affect customers' internet banking adoption intentions. However, in contrast with traditional bank branches, since ATMs also constitute a technology-based self-service channel, it is very likely that satisfaction with them will be proved to positively influence BI.

3.4. Research model

The model utilized in the present research (Figure 2), as ensued from the previous discussion, incorporates the following possible behavioural intentions affecting factors:

- *Beliefs:* perceived ease of use, perceived usability, perceived credibility
- *External variables:* web-usage intensity, prior e-shopping experience, domain personal innovativeness, satisfaction with bank branches, satisfaction with ATMs

Figure 2 Research model
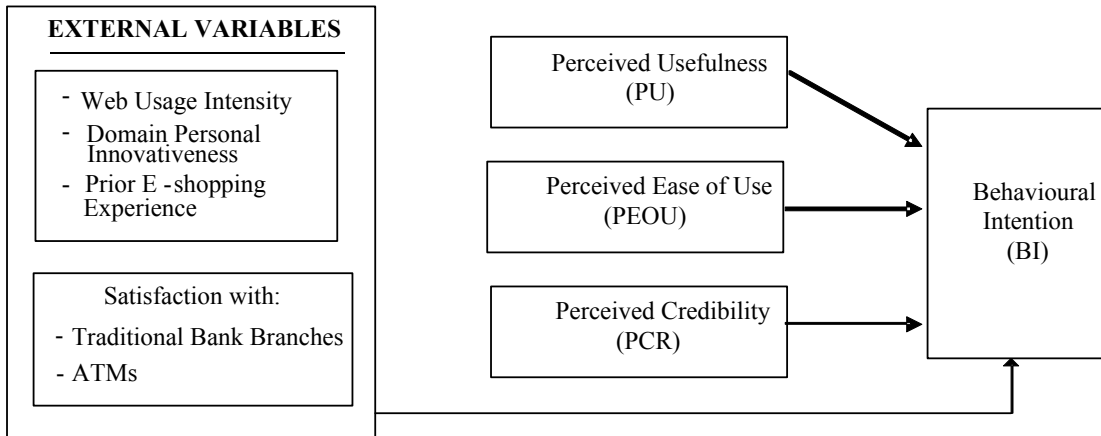
4. Research Methodology

4.1. Research instrument

Field research was conducted by utilizing an interviewer-administered questionnaire, which, as shown in Table 1 was developed by largely adopting relative constructs reported in literature.

Table 1 Sources of research questionnaire constructs

CONSTRUCT	SOURCE
Web usage intensity (2 items)	Lassar et al (2005)
Prior E-shopping experience (1 item)	Self-worded
Perceived ease of use (5 items)	Davis (1989), Wang et al (2003) and Sundarraj and Wu (2005)
Perceived usefulness (5 items)	Davis (1989), Wang et al (2003), Sundarraj and Wu (2005)
Perceived credibility (2 items)	Wang et al (2003)
Domain personal innovativeness (5 items)	McKnight et al (2002)
Behavioural Intention (2 items)	Wang et al (2003)
Satisfaction with bank branches (1 item)	Self-worded
Satisfaction with ATMs (1 item)	Self-worded

Each item was assessed by a seven-point Likert-type scale, indicating the respondent's strength of agreement and ranging from 1="I strongly disagree" to 7="I strongly agree". Moreover, there was an additional section aiming to capture the demographic data of the survey respondents, including gender, age, educational level and monthly income.

4.2. Sampling

The questionnaire was initially pilot-tested by 3 directors of bank branches in the Greek region of Thessaly and 11 internet users, all of which were approached by direct contact. The results of the pilot test proved to be very satisfactory, since all the respondents found the questionnaire items understandable. Minor rewording recommendations, made by the pilot test participants, were incorporated into the questionnaire's final version. Furthermore, there was no respondent who hesitated to answer any question for any reason.

The research target sample consisted of internet users who have at least one bank account and are located in cities of Thessaly. Respondents were approached randomly at bank branches and internet cafes. The resulting sample comprised 271 questionnaires, 5 of which were dismissed because of missing answers, thus resulting in a sample consisting of 266 valid responses.

4.3. Data analysis and results

Principal component analysis (Table 2) was initially performed to identify latent factors within the questionnaire items measuring customer beliefs. The Bartlett sphericity testing the degree of correlation between the variables ($p < 0.000$) was significant. Furthermore, the Kaiser–Meyer–Olkin value (KMO=0.904) verified the appropriateness of the sample for performing factor analysis, as it well exceeds the 0.5 acceptable limit (Kaizer, 1974; Norusis, 1990).

Three factors with eigenvalues greater than one were extracted from data, accounting for 81.01% of the total variation (Kaizer, 1960; 1974). A cut-off of 0.50 was used for item scale selection. Following an examination of the items' loadings on each factor, the 3 distinct principal components that were identified were labeled as perceived ease of use (PEOU), perceived usefulness (PU) and perceived credibility (PCR).

Table 2 Principal component analysis of customer belief items

	Perceived ease of use	Perceived usefulness	Perceived credibility
PEOU1	**.671**	.287	.355
PEOU2	**.896**	.248	.122
PEOU3	**.875**	.277	.111
PEOU4	**.855**	.312	.176
PEOU5	**.739**	.373	.216
PU1	.360	**.787**	.150
PU2	.421	**.789**	.132
PU3	.416	**.765**	.251
PU4	.184	**.783**	.226
PU5	.224	**.804**	.314
PCR1	.183	.257	**.907**
PCR2	.236	.270	**.885**

Inter-item analysis was then used (Table 3) to verify the 3 emerged customer belief factors and the web usage intensity and domain personal innovativeness scales for internal consistency and reliability (Nunnally and Bernstein, 1994). More specifically, Cronbach's coefficient alpha (Cronbach, 1960) was calculated for each scale. The values ranged between 0.88 and 0.93. Therefore, all scales exhibited values well over the minimum acceptable reliability level of 0.7 (Nunnally, 1967).

Table 3 Internal reliability analysis of scales

SCALES	CRONBACH'S ALPHA
Web usage intensity	0.88
Perceived ease of use	0.93
Perceived usefulness	0.92
Perceived credibility	0.92
Domain personal Innovativeness	0.93

Linear regression analysis was conducted to examine if the external variables and the customer beliefs scales are predictors of behavioural intentions. As shown in Table 4, perceived usefulness, domain personal innovativeness, perceived credibility, satisfaction with ATMs and perceived ease of use have a significant positive effect on behavioural intentions, while increasing income affects it negatively. Additionally, 60.3% of the behavioural intentions variance is explained by the independent variables.

Table 4 Regression analysis for behavioural intentions predictors

INDEPENDENT VARIABLES	STANDARDIZED COEFFICIENTS (BETA)	SIG.
Gender	.001	.975
Age	.071	.139
Education	-.045	.290
Income	-.089*	.073
Web-usage intensity	-.020	.719
Prior E-shopping experience	.049	.287
Satisfaction with bank branches	-.036	.426
Satisfaction with ATMs	.160***	.001
Domain personal innovativeness	.297***	.000
Perceived ease of use	.123**	.040
Perceived usefulness	.347***	.000
Perceived credibility	.214***	.000

Dependent variable: Behavioural intentions, Adjusted R^2=0.603
*** Coefficient is significant at level 0.01 **Coefficient is significant at level 0.05
*Coefficient is significant at level 0.1

5. Conclusions and Future Work

The results showed that the most significant determinant of BI was proved to be PU. PEOU, which is the other perception construct of the original TAM, was also found to have a significant effect on BI but changes on it have a less important effect on BI. Similar observations regarding the comparative salience of TAM's customer perceptions constructs as predictors of BI have also been made by other TAM-based researchers (e.g. Eriksson et al, 2005). Therefore, bank managers have to focus on how to strengthen the usefulness perception of internet banking by emphasizing its performance, convenience, productivity and effectiveness features in their promotion campaigns.

Personal innovativeness in the domain of internet was found to be the second most important determinant of intentions to use internet banking. This construct's importance as a determinant of BI in TAM-based researches, in the context of internet banking, has been also pointed out in the work of Lassar et al (2005). As a result of this, segmentation must take place, which will distinguish customer groups according to their members' adventurous nature, regarding internet usage.

The findings also suggest that PCR is a significant determinant of BI. Moreover, changes in PCR will exhibit a greater effect on BI, when compared to what would be caused by a change in PEOU. This result is in contrast to the findings of Wang et al (2003), whose outcomes revealed that the effect of PEOU on BI, in the internet banking context, outperforms all the other customer beliefs scales' effects. Hence, banks must employ advanced security technologies and focus internet banking promotion campaigns on privacy and security processes and guarantees.

The findings also verified the assumption made earlier that an increase at the level of satisfaction with ATMs would have a positive effect on BI, since it appears that bank customers who are satisfied with ATMs are positively predisposed towards internet banking. On the other hand the results did not verify the assumption made about the negative effect of satisfaction with traditional bank branches on BI.

Moreover, another interesting result shows that customers with higher income are less prone in adopting internet banking. This could be attributed to the fact that such customers are usually involved into higher volume and more complex transactions, which can be dealt with more effectively in face-to-face meetings with employees, something that obviously internet banking cannot support.

Finally, perhaps quite unexpectedly, the results showed that the level of customers' involvement with internet and e-shopping use does not play a significant role in determining BI. This means that the efforts on increasing internet banking adoption should target internet users uniformly, without segmenting them based on their use levels.

Our future work plans are twofold:

1. To conduct further statistical processing on the data of the present research, in order to identify other possible relationships among the model constructs. More specifically, the focus will be on the possible mediation effect that each of the 3 beliefs may have between the other constructs and BI.
2. To extend the model with additional external variables and repeat the survey. This will serve both the development of a more complete model and the confirmation of the present research results.

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