



## **Influence of Psychographics and Risk Perception on Internet Banking Adoption: Current State of Affairs in Britain**

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### **ABSTRACT**

This paper investigates the factors which determinate internet banking (IB) decisions among UK IB customers based on a survey which resulted into 191 usable questionnaire respondents randomly collected from a UK city. A linear regression technique is used to analyse data. It is found that perceived usefulness and perceived ease of use consistently have significant positive impacts on the decisions of IB adoption while these IB users are specifically concerned about security risk, privacy risk and financial risk related to using IB services. However, social risk has no significant impact on their decision to adopt IB. The findings indicate that traditional technology related factors are still relevant but psychological barriers, especially risk concerns have significant negative impacts on consumers' attitudes towards IB.

**Keywords:** Internet Banking, Consumer Perceptions, Psychological Barriers, UK

**JEL Classification:** L81, L86, O33

### **1. INTRODUCTION**

The rapid pace of technological development, especially the emergence of the internet is creating arrays of new business opportunities (Gkoutzinis, 2006; Hamdi, 2011). Internet Banking (IB) is one such successful example and it has become one of the most attractive alternative retail distribution channels in terms of usage rate (Guerrero et al., 2007). With its global reach and tens of millions of users, IB has brought numerous opportunities but also fierce challenges for the banking sector, development of which is very important for any economy (Salahuddin et al., 2012).

IB (also referred to as online banking or E-banking) describes the case where customers use bank services through the internet. IB provides consumers with convenience of accessing most bank services such as reviewing bank statements, making money transfers or payments, and even selecting varieties of financial products offered by banks and managing their investment portfolios while sitting at home, in the office or travelling by using computers, mobile phones and digital TVs, etc. Because of the fact that IB users operate on digital media, banks can save huge amounts of money in developing additional software or

infrastructure (Polasik and Wisniewski, 2009). As such, IB that emerged in the 1990s may have changed the structure of banks and the pattern of banking services permanently.

Despite IB's apparent advantages for banks and bank customers, the adoption rates vary across countries and are not as high as many banks expected (Sayar and Wolfe, 2007). In other words, banks face huge (sometimes even daunting) challenges in promoting IB services and maintaining its safety. This is because on the one hand, banks need to satisfy customers' needs in order to compete in the sector. However, those needs might be complex or even difficult to manage (Jayawardhena and Foley, 2000) as they are concerned with responses to environment changes, particularly to new technology development and security upgrades. The effective risk management is crucial for the success in the banking sector (Nair et al., 2014). On the other hand, customers' perceptions to IB are the utmost determinant of IB service adoption. If customers have strong psychological barriers to IB, their attitudes towards using online banking services are prudential, resistant and limited.

Studies on IB perceptions have switched from earlier focus on technology usefulness to psychological factors more recently

(i.e. consumers' perceptions) because the latter have been proven to be important predictors of technologically based innovation adoption such as IB (Venkatesh et al., 2003; Konana and Balasubramanian, 2005). Laukkanen et al. (2008) assert that psychological barriers have bigger influences than technological usage and value when consumers decide if or not to adopt IB. The results from Gounaris and Koritos (2008) also confirmed that psychological barriers have the best predictability of consumers' decisions to adopt or reject IB.

In recent years, there has been a growing concern over online banking security and more and more consumers are worried about the risks of using IB services. This has mainly been a result of numerous fraudulent incidents such as cyber hacking, phishing attacks, online and/or telephone scams and even more recently the Heartbleed Bug (BBC, 2014). These remain a serious threat, even though banks have made significant efforts to protect and safeguard clients' accounts from online fraud. There is evidence that suggests that the loss from online bank fraud exceeds that from actual on-site bank robberies<sup>1</sup>. Once a bank reports IB security breach, it not only faces operational risk but more importantly, long-term reputational and legal risks. As such, understanding clients' risk concerns, engaging security communication in IB issues with customers, designing and implementing security measures and controls have become vital factors for banks' to be sustainable businesses (Koskosas, 2011).

More and more attention has been given to consumers' psychological barriers to adopting IB recently, in particular to perceived risk concerns but there is lack of research carried out in the UK in this context. As such, the aims of this study are to investigate the factors that determine IB take-up decisions among UK customers and the extent to which psychological barriers have played a part in influencing their decisions on the use of IB. The emphasis here will be on the types of concerns or risks and their individual components contributing to the decision making process. The reason for the UK choice is based on the followings. Theoretically Britain has a more favourable environment for IB with regards to its technological infrastructure and advanced banking sector (Sayar and Wolfe, 2007). For example, the automated teller machines was pioneered by Barclays Bank in 1967 (Polasik and Wisniewski, 2009). However, despite the fact that IB in the UK is widely used and quite advanced relative to emerging economies (see an example for Turkey in Sayar and Wolfe, 2007), it is now far behind other developed peers in Europe (such as Germany and France) and the USA<sup>2</sup>. Therefore, more research is urgently needed to understand UK customers' perceptions and behaviours regarding IB in order to formulate a comprehensive institutional framework conducive to successful and effective development of IB (Yousafzai and Yani-de-Soriano, 2012). Furthermore, to the best of our knowledge, there is no study carried out in the UK focusing on our project coverage.

After reviewing the theoretical framework and empirical evidence, this paper develops a number of hypotheses to test the relationship between the attitude governing IB adoption and the factors influencing customers' decisions in the use of IB. The factors reviewed include traditional technology acceptance factors (i.e. perceived usefulness and perceived ease of use) and newly recognised psychological barriers (e.g. security risk, privacy risk, performance risk, financial risk and social risk). Using questionnaire as a survey instrument, we collected data in a north England city in 2013. We achieved 191 usable respondents for linear regression data analysis. The findings suggest that perceived usefulness and perceived ease of use consistently have significant positive impacts while security, privacy and financial risks are three top risk concerns that have significant negative impacts on the decisions of IB adoption among UK IB users.

This paper is structured as follows. The next section reviews three mainstream theories in this field within which an evolution process through which the theoretical framework developed can be observed, from a frameworks only containing traditional technology acceptance elements to those incorporating more psychological barriers. Section 3 comprises hypothesis development to establish the conceptual framework to provide for tests of the relationships between the dependent variable (attitude of IB adoption) and independent variables (factors influencing the adoption decision). Section 4 briefly outlines the methodology used in the study and Section 5 analyses the empirical results. Finally, we conclude by discussing the theoretical contributions and policy implications of the results, and highlight the limitations of this study in Section 6.

## 2. EVOLUTION OF THEORETICAL FRAMEWORKS

A widely cited theory explaining consumer acceptance of using technology is the Technology Acceptance Model (TAM), initiated by Davis (1989) and later developed by other scholars such as Bagozzi et al. (1992). According to TAM, customers' attitudes towards new technology are mainly influenced by "Perceived usefulness" and "Perceived ease-of-use," as described in Davis (1989, p.320). According to this study, "the degree to which a person believes that using a particular system would enhance his/her performance and or "the degree to which a person believes that using a particular system would be free from effort" determine their attitude towards adoption of a new technology. In other word, TAM assumes that it is consumers' beliefs about "usefulness" (value) and "ease of use" (usage) that determine their attitudes toward new technologies such as online banking. This model has been extended by considering more factors. For instance, Venkatesh and Bala (2008) proposed that risk perceptions and trust factors should also be incorporated in the model. Other critique of the original model includes lack of practicability, limited explanatory and predictive capability (Pikkarainen et al., 2004; Benbasat and Barki, 2007). These newer contributions to the theory imply that TAM in its original form is not sufficient in explaining consumers' behaviour towards adopting IB. This is because it focuses only on the technological factors but ignores important social and psychological factors (Gounaris and Koritos,

1 <http://www.bankrate.com/finance/savings/could-bank-hackers-steal-your-money-1.aspx>. (Accessed April 2014).

2 For instance, Forrester Research (2009) found that more than half of UK customers still visit bank branches and are reluctant to adopt IB. <http://www.internet-banking.com/tag/gartner-group/>. (Accessed 20/04/14)

2008). In response to these critiques, two theories, the Diffusion of Innovations (DoI) and Perceived Characteristics of Innovation (PCI), have emerged in the literature.

The DoI theory was first presented in 1962 in the book DoI (Rogers, 1962) which was further developed (Rogers, 2003). Rogers (1962; 2003) explain how new technologies and ideas spread in society and the theory suggests that innovation is spread or diffused in society through various channels, and particularly through four elements. These channels include innovation, communication, time and social system. It also suggested that innovation should be widely adopted to be sustainable. According to this theory, there are five important attributes that can predict people's behaviour towards innovation diffusion and adoption. They include, (1) Relative Advantage - the degree to which an innovation is seen as better than the idea, program, or product it replaces, (2) Compatibility - how consistent the innovation is with the values, experiences, and needs of the potential adopters. Also, (3) Complexity - how difficult the innovation is to understand and/or use, (4) Trialability - the extent to which the innovation can be tested or experimented with before a commitment to adopt is made and (5) Observability - the extent to which the innovation provides tangible results. Like TAM, DoI has also been criticised for its limitations, e.g. unrealistic assumption that the benefits of innovation spread to all parts of society (Goss, 1979), the application inconsistency with missing risk considerations (Stephenson, 2003), and ignoring the roles, attitudes and intentions in the process of adoption (Ozdemir et al., 2008).

The PCI framework was developed by a number of scholars to address the limitations of TAM and DoI. For example, Moore and Benbasat (1991) extended the factors of innovation adoption into eight categories: Relative advantage (usefulness), compatibility, ease of use (complexity), result demonstrability, image, visibility, trialability, and voluntariness. Their contributions did not only expand the usability attributes of TAM and the capability of DoI, but most importantly incorporated social and psychological aspects of technology acceptance, which provided for the explanation of TAM in a more meaningful way (Gounaris and Koritos, 2008). Many other studies have also added additional components to TAM and DoI to enrich PCI framework (see for example Wang et al., 2003; Pikkarainen et al., 2004; Eriksson et al., 2005; Ozdemir et al., 2008).

During the development of the frameworks, the concept of consumers' perceived risks has been notably emphasised, alongside more and more internet frauds reported. As Ozdemir et al. (2008) argued that due to the fact that IB is operated in open internet technology infrastructure which is lacking in sufficient regulations on e-commerce activities, consumers feel uncertain about using IB. Therefore, "trust" is insufficient to measure customers' perceptions while in contrast, "risk" is a more comprehensive measure of the consumer's perceptions of uncertainty and potential adverse consequences of buying a product or using a service online (Littler and Melanthiou, 2006). Furthermore, perceived risks have different types (e.g. social risk, financial risk, security risk, and performance risk), with each type perhaps being independent of the other and having different

predictive value and need to be separately assessed (Grabner-Kräuter and Faullant, 2008).

### 3. FACTORS AFFECTING IB ADOPTION AND TESTABLE HYPOTHESES

Process of adoption can be referred to a person who makes decision on becoming a regular user of a service/product (Karjaluoto et al., 2002) and the perceptions of this person on the service/product are the key. Prior literature on IB adoption behaviour reveals that the common psychological barriers and personal characteristics are the main contributors to the process of decision making on IB adoption. In the case of psychological characteristics, studies have identified many different factors as independent variables (see for example, Pikkarainen et al., 2004; Gounaris and Koritos, 2008; Laukkanen et al., 2008; Chuang and Hu, 2011; Munusamy et al., 2012). In this section, we will discuss two classical variables originated from the TAM framework, i.e. perceived usefulness and perceived ease of use. However, our focus is to examine perceived risks including security, privacy, finance, performance and social risks as these have received increasingly greater concerns among IB adopters and non-adopters. We will use these factors to build up a set of testable hypotheses for our data analysis.

In addition to psychological factors, attitudes towards IB usage are also found to be linked to personal characteristics/traits, such as gender, age, occupation, education level and income. For example, results from Gefen and Straub (1997) and Shergill and Li (2005) show that males appear to be more willing to adopt new technology compared to females. With respect to age, Santouridis et al. (2009) and Mann and Sahni (2012) suggested that younger consumers value more saving time and convenience by using IB compared to older people. In terms of income levels, Christiansen (2001) found that higher income and higher acceptance rate of electronic finance products/services are strongly correlated and this probably reflects the link between high income and good IT skills. Similarly, Al-Weshah (2013) stressed that income and education levels have a tendency to affect the acceptance of technology. Polasik and Wisniewski (2009) on the other hand found that the usage of IB is higher for white-collar workers. In our study, these demographic characteristics have been considered and will be discussed in the section of the methodology. In the meantime, the following are discussed.

#### 3.1. Perceived Usefulness

As indicated in the TAM framework (Davis, 1989) and related earlier works of Theory of Planned Behaviour and Theory of Reasoned Action (Ajzen and Fishbein, 1980), perceived usefulness is the primary element for potential users to consider in making a decision whether or not to adopt new technology such as IB. This is because users have the belief that the usefulness of a particular system could enhance their job performances. Extensive evidence in sequential studies have confirmed the significant correlation of perceived usefulness on customers' adoption of IB and adoption of IB (see examples, Eriksson et al., 2005; Guriting and Ndubisi, 2006; Jahangir and Parvez, 2012; Mann and Sahni, 2012). In particular, Gerrard and Cunningham (2003) suggested

that the perception of usefulness on online banking depends on the services banks provided, in terms of needs of customers such as paying bills, applying for a loan, obtaining information on mutual funds, transferring money abroad, and checking banking balances. Pikkarainen et al. (2004) argued that in the 21<sup>st</sup> century, banking customers are more likely to pursue useful technologies, for instance, more user-friendly and innovative self-service technologies as these technologies can provide them with greater autonomy in purchasing financial products, obtaining information on financial advices, and performing transactions.

### 3.2. Perceived Ease of Use

Perceived ease of use is also originated from TAM (Davis, 1989) and it refers to the belief that users of new technology feel that using the product/service would be free of effort. If the easier the use of an application is perceived to be by customers, this product/service is more likely to be accepted by them (Cheng et al., 2006). This is because they feel more certain by applying existing routines to similar situations without extra cost (Gefen and Straub, 1997). In this regards, banks have to compete in creating and operating a comprehensive interface of user-friendly IB environments for easy-to-use innovations to promote the process of users' adoption. This process becomes routine work for banks to be sustainable in attracting new and retaining existing customers (Eriksson et al., 2005). The empirical literature has provided ample evidence on the close relationship between IB adopters and their perceptions of ease of use IB. For example, Wang et al. (2003) showed that perceived ease of use is strongly related to the adoption of online banking. The findings from Jahangir and Parvez (2012), Mann and Sahni (2012) indicated that perceptions of ease of use boost the usage of information technologies, as such, perceived ease of use is one of the most important elements that affect IB adoption.

Apart from the two variables (perceived usefulness and perceive ease of use), as discussed above, our particular attention will be drawn to several dimensions of perception of risks which are associated with the growing trend in adoption of online banking in recent years. Different types of perceptions of risks are discussed in the literature and each of them, despite some overlap to some extent, has distinctive features and generally independent of one another (Grabner-Kräuter and Faullant, 2008). Our focus in this study will be on discussing perception of risks related to security, privacy, performance, financial and social issues. This is because these are common concerns observed in IB adopters and non-adopters and these factors have also been widely examined in the existing literature.

### 3.3. Perceived Security Risk

Perceived security risk describes customers' beliefs in potential uncertainties or loss caused by the vulnerability of IB, which will lead to unexpected and unnecessary personal stress (Ozdemir et al., 2008). This is because online transactions take place in a generally opened virtual environment, and information through the platform may be intercepted by third party, which might compromise users' information safety. As such, customers' fulfillment and expectation of online perceived security risk become an important factor that influences their attitude towards adoption of IB services (Bhatnagar et al., 2000; Lee et al., 2009). The adoption process of a product/service of IB will only happen

when customers feel it is secure and free of risks (Siu and Mou, 2005). Moreover, consumers who have perception security risk may think all online transactions are risky, which could cause far-reaching consequences, including resistance to other products/services provided by banks. In contrast, customers who perceive IB as having low security risk would be more adaptable to using online services. Unless banks and financial institutions are fully aware of and seriously address potential problems in relation to security breach, IB business may be off limit for many (Gkoutzinis, 2006). As Miyazaki and Fernandez (2001) stated, that it is urgent matter for banks to focus on internet security in order to build consumer confidence in using the service.

### 3.4. Perceived Privacy Risk

Perceived privacy risk is linked to perceived security risk as the former is part of the latter. However, perceived privacy risk refers to the concerns about personal and private information being revealed due to unauthorised access to this information by third parties and/or the beliefs that banks make use of private information about their clients without their consent (Ozdemir et al. 2008). As with perceived security risk, customers become more and more concerned about their private information being compromised as a result of frauds or hacking through banks offering a wide range of products/services via the internet open platform (Reavley, 2005). A number of studies suggest that privacy risk perception and lack of security in IB have been the main influences on customers' adoption attitudes (Chen and Barnes, 2007). For example, Hernandez and Mazzon (2007) stressed that privacy issues relating to IB have created significant barriers to the up-take of online banking products and services. Littler and Melanthiou (2006) showed that as a major concern of most online banking users, fraud and hacking not only cause the losses of their money, but also violate their privacy. Rotchanakitumnuai and Speece (2003) pointed out that it creates a negative effect if customers' personal information is unsecured and there is the possibility that their privacy can be revealed in the virtual environment. Therefore, it is important for IB service providers to ensure that online banking activities are safe and their customers' privacy are well-protected.

### 3.5. Perceived Performance Risk

Perceived performance risk is the concerns about potential monetary loss that may be incurred because of deficiencies or malfunctions in IB activities (Kuisma et al., 2007). Users of IB are always apprehensive about the possibility that the system breaks down while they conduct their online transactions, as these unexpected incidents often lead to unexpected losses in their bank accounts or personal stress (Mattila et al., 2003). Perceived performance risk is closely linked to consumers' trust in bank's technical capability and maintenance of IB system. Krauter and Faullant (2008) found that trust in the internet has significant impact on the risk perception and consumer attitude towards IB. According to Littler and Melanthiou (2006), malfunction or deficiency of IB websites could lead to a reduction in customers' willingness to utilize IB services.

### 3.6. Perceived Financial Risk

Perceived financial risk is closely related to perceived performance and security risks but it is concerned with customers preoccupation

with potential monetary loss due to misuse of bank account or transaction error (Kuisma et al., 2007). According to Kim et al. (2008), users of IB are afraid of losing money while transferring money or making transactions over the internet. Compared to traditional banking, IB transactions lack the assurance provided in traditional setting through formal proceedings and receipts. Once transaction errors occur, customers of IB often find it difficult to ask for compensation (Littler and Melanthiou, 2006).

### 3.7. Perceived Social Risk

Perceived social risk refers to the possibility that using online banking may result in disapproval of a person's family, friends and colleagues. As Chen and Barnes (2007) state, it is possible for a person's social standing to be diminished or enhanced depending on how online banking is viewed by people surrounding him or her. People have the subjective norm that they are concerned about the opinions of their family, friends and colleagues regarding to their own actions. Their actions would be encouraged or discouraged by people surrounding them who have favorable or unfavorable perceptions of IB. In this regards, one's view on IB adoption would be affected by his or her family members and or social network (Yang et al., 2004).

Drawing on the theoretical frameworks and empirical evidence discussed, we thus propose a set of hypotheses to be tested in this piece of work:

1. H1: Perceived usefulness has positive effects on customers' adoption of IB.
2. H2: Perceived ease of use has positive effects on customers' adoption of IB.
3. H3: Perceived security risk negatively influences customers' attitudes towards the use of IB.
4. H4: Perceived privacy risk negatively influences customers' attitudes towards the use of IB.
5. H5: Perceived performance risk negatively influences customers' attitudes towards the use of IB.
6. H6: Perceived financial risk negatively influences customers' attitudes towards the use of IB.
7. H7: Perceived social risk negatively influences customers' attitudes towards the use of IB.

## 4. METHODOLOGY

The data used in this study was randomly collected face to face by a standardized questionnaire from the high street in a north of England city from April to June 2013. However, the young professionals were particularly targeted in the distribution of the questionnaires because they are consistently identified in the literature as the majority of IB adopters. In this case, the sampling is limited in representing the whole population but might be better representing the IB user population. In total 215 questionnaires were distributed with 191 usable questionnaires for the data analysis. The demographic profile of the questionnaire respondents is set out in Table 1 below which suggests the majority in our sample is young people aged 18-35 with a high education level and average yearly earning between £10,000 and £25,000.

The questions in the questionnaire are designed to measure each of the factors reviewed in the previous section to facilitate

**Table 1: Demographic profile of respondents**

Characteristic	Frequency	%
Gender		
Male	79	41.0
Female	112	59.0
Age		
18-25	93	49.0
26-35	59	31.0
36-45	23	12.0
>46	16	8.0
Education qualification		
Primary school	4	2.0
High school	9	5.0
Colleges	52	27.0
Undergraduate degree	81	42.0
Master's degree	36	19.0
Doctorate degree	9	5.0
Income		
<£10,000	86	45.0
£10,000-£14,999	27	14.0
£15,000-£24,999	22	12.0
£25,000-£34,999	39	20.0
£35,000-£44,999	12	6.0
£45,000-£54,999	3	2.0
>55,000	2	1.0
Occupation		
White collar	92	48.0
Clerk	99	52.0

hypotheses testing. A summary of the variables, their definitions and measurements of the questions can be seen in Table 2.

A linear regression analysis framework is proposed for hypotheses testing according to the following equation:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + e_i$$

Where  $Y_i$  is the response variable and  $X_{ii}$  is the explanatory variable, and  $\beta_i$  is the coefficient of the explanatory variable indicating the nature of the relationship between the dependent and independent variables,  $\beta_0$  is the constant term and  $e_i$  is the overall error term.

## 5. RESULTS AND DISCUSSIONS

The path coefficients were calculated applying the technique of simple linear regression and the results are set out in Table 3.

Table 3 suggests customers' attitudes towards the adoption of IB are positively influenced by their perceptions of usefulness and ease of use of this service but negatively influenced by their perceptions of its potential risks. The results generally confirmed our testable hypotheses, however in varying degrees. Explaining it in more details, perceived usefulness (beta = 0.421,  $P = 0.00$ ) and perceived ease of use (beta = 0.367,  $P = 0.00$ ) are strongly and positively correlated with adoption of IB and are strongly statistically significantly. However, all the risk factors (security risk, privacy risk, performance risk, financial risk and social risk) have been observed to be negatively correlated

**Table 2: Variables and their measurements**

Variables	Measurement
Dependent variable	Attitudes to IB adoption
Independent variables	
Perceived usefulness	IB would enable me to accomplish my tasks quickly IB would make it easier for me to do my tasks I think IB is useful Overall, I think using IB is advantageous
Perceived ease of use	Learning to use IB is easy I do not feel there is a problem using IB
Security risk	I'm worried about using online banking because other people may be able to access my account I would not feel secure sending sensitive information through IB
Privacy risk	I do not feel totally safe by providing personal privacy information through IB
Performance risk	IB may not perform well because of slow speed, server breakdown or maintenance of the website, etc. IB server may not perform well or process payments incorrectly
Financial risk	When making transfer online, I am concerned about losing money because of internet faults When transaction errors occur, I worry that I may not get compensation from the bank
Social risk	If I do not use online banking, I am concerned my friends, family and colleagues would look down on me If my bank account encountered fraud or was hacked, I am concerned I would be blamed or laughed at by my family, friends and colleagues

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**Table 3: Liner regression results of independent variables and the dependent variable**

Hypotheses	Independent variables	Beta	t value	P value
H1	Perceived usefulness	0.421	6.009	0.00
H2	Perceived ease of use	0.367	4.989	0.00
H3	Security risk	-0.356	4.177	0.035
H4	Privacy risk	-0.296	3.423	0.027
H5	Performance risk	-0.112	2.660	0.017
H6	Financial risk	-0.261	3.224	0.026
H7	Social risk	-0.020	0.332	0.130

with adoption of IB (beta = -0.356,  $P = 0.035$ ) with security risk found as the most important inhibitor to the adoption of IB followed by privacy risk (beta = -0.296,  $P = 0.027$ ), financial risk (beta = -0.261,  $P = 0.026$ ), performance risk (beta = -0.112,  $P = 0.017$ ) and social risk (beta = -0.020,  $P = 0.130$ ). It is notable that the  $P$  value for social risk is not at a statistically significant level (i.e. >0.1).

The findings of this study reveal that the perceived usefulness and perceived ease of use of IB are consistently the positive primary reasons among UK bank customers in their decisions to adopt IB. This finding indicates that the TAM is still relevant to be used in explaining the behaviour of IB adopters. If you consider the fact that our sample is generally associated with young professionals who use new technology on a daily basis, it is understandable why they give higher value to the technology related factors. In other words, if other samples representing more older and non-professionals who are not familiar with technology enhanced products (e.g. IB) and have little knowledge about how to protecting their personal and privacy demographics, they might be more concerned about IB risks than perceived usefulness and perceived ease of use. This finding is widely supported by the theoretical (e.g. Davis, 1989) and empirical (including a number of studies mentioned in the previous sectors) literatures.

The study also provides clear evidence that risk concerns are important attributes hindering UK bank consumers in considering

the use of IB. This finding also supports the framework of The PCI theory (e.g. Moore and Benbasat, 1991) suggesting that the original elements in the TAM and the DoI models are not enough in the explanation of IB adoption attitudes as social and psychological aspects of technology acceptance are also important factors influencing the adoption of IB. Specifically, perceived risk concerns are observed to be negative factors influencing IB acceptance intentions, thus technological usage and values should be taken into account with psychological and social factors in the understanding of IB adoption.

Lack of similar studies carried out in the UK makes a comparison impossible. However Sayar and Wolfe (2007) evaluated IB services in Turkey and the UK and found that Turkish banks are more advanced than British banks in terms of networked branches and internet services despite UK banks sophistication in banking services and technological infrastructure. Moreover, there is a fundamental difference in the approaches for banks in handling security issues with Turkish banks relying on technology approaches while British banks preferring more conventional methods to mitigate it. Despite lack of UK studies for comparability, our findings can be used to support or contrast similar research in other countries. For example, in the study of technology acceptance of IB in Estonia, Eriksson et al. (2005) confirmed that a central role played by perceived usefulness of IB determines whether perceived ease of use would lead to an increase in the use of IB. In Austria, Grabner-Kräuter and Faullant (2008) found consumers' trust in internet risk perceptions influenced their attitudes towards IB. Polasik and Wisniewski's (2009) study in Poland revealed that a dominant relationship has been observed in "the link between the decision to open an online account and the perceived level of security of internet transactions" (p.32). By contrast, the study carried out in Finland by Laukkanen et al. (2008) claimed that psychological barriers are a more important determinant of resistance to utilizing IB than usage and value contained in the traditional TAM.

## 6. CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

This study has identified some important factors underlying the decision to adopt IB by UK IB customers. These factors include perceived usefulness, perceived ease of use, perceived security risk, perceived privacy risk, perceived performance risk, perceived financial risk and perceived social risk, of on IB. Perceived usefulness and perceived ease of use are the main components in the TAM (Davis, 1989) and the DoI theory (Rogers, 1962). They are typically treated as traditional technology acceptance variables. Other factors important for considerations in the PCI framework are defined as psychological barriers and are thought to become vital barriers in the development of IB nowadays and in the future. Our results suggest that perceived usefulness and perceived ease of use consistently have significant positive impacts on the decisions of IB adoption among UK IB users, and in the meantime, customers are specifically and significantly concerned about the risk of security compromises which might cause private information leaks and potential financial losses. These respondents in our sample do not feel much pressure from family members, friends and colleagues about the decision of using or not using IB which indicates that social risk could be ignored in the studies of IB in the UK.

Our findings indicate TAM and DoI theoretical models are not out of date at all and they are still very relevant to the perceptions of current or potential IB users. However, more psychological variables, especially risk barriers should be incorporated in the theoretical framework. The results can clearly provide for policy implementation opportunity to banks and IB providers that on the one hand, they should continue improving IB functions and services to enhance its usage (usefulness) and value (ease of use) in order to retain current IB customers and attract potential new IB users. On the other hand, they should address the real and serious challenge of how to prevent security breaches in order to ensure the sustainability of IB business. Furthermore tackling security problems cannot be effective in isolation in the financial sector as it requires corporations across sections of society, regions, countries and even continents. Thus how banks and financial institutions effectively work with all the parties involved, including financial services authority, government legislations, law enforcement and customers is a sustained and long-term task. The findings in our study also provide a wake-up call to other IB users or potential users and suggest that security risks have become the biggest concern for IB, and asks the question to what extent they are aware of these issues and much they have learned or used proper measures to protect and safeguard their financial interests.

The limitations of this study can be identified as follows: (1) the sample has a big proportion of young professionals (as we argued before, they are the majority of IB users) and the primary data collected was only limited to a city in England, and in this regard, our findings can hardly be generalizable to the entire UK population; (2) we are unable to identify if the respondents are permanent residents in the UK or temporally living in the UK, and consequently we cannot conclude whether this is a typical UK characteristic; (3) we did not link the respondents to the banks/IB providers they use for IB services and therefore we are

unable to comment specifically on the bank/IB provider services. These limitations can be addressed in future research. Although there are some limitations in this study (as in other studies), the research is an updated survey conducted in the UK. It has provided interesting findings which support relevant theories and earlier findings, highlights important factors in this research area and has important policy implications in business practice. In short, it has added value to the body of knowledge in the development and utilization of IB.

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