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# Factors Influencing People’s Intention to Adopt E-Banking: An Empirical Study of Consumers in Shandong Province, China

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**ABSTRACT**— *E-Banking is growing at an unprecedented rate and has become a truly worldwide phenomenon, offering convenience, flexibility and interactivity for those that can, and know how to access it. This is clearly evidence in China. However, despite such growth and popularity, some users still have reservations about using Information and communication technology (ICT) in their daily banking activities, perhaps due to deep rooted cultural factors that cause consumers to question the efficacy of such changes. Through the application of a technology acceptance framework, and empirical evidence from 52 E-Banking user questionnaires and four key market segment interviews, the research explores the factors that influence consumers’ intention to adopt E-Banking in Shandong Province of China. The findings highlight that perceived usefulness and perceived credibility are significant factors which have a positive influence on consumers’ intention to utilise E-Banking, while perceived ease of use and perceived cost are less significant. Unpacking the reasons for resistance to the use of E-Banking highlighted that “difficult to operate”, “unnecessary to use it” and “worry about the security” are key drivers and therefore challenges for the service providers. Based on the results, recommendations are drawn for banks, involving focusing on the significant factors, avoiding weaknesses and optimising strengths of E-Banking and ultimately developing more accurate market positioning strategies to align and manage consumer expectations and maximise potential acceptance.*

**Keywords**— E-Banking, China, Technology Acceptance Model (TAM), Cost

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## 1. INTRODUCTION

Developments and trends in Information and communication technology (ICT) in recent years have impacted greatly on the banking sector worldwide. They have increased the market scope of the sector, opened up new product opportunities and reduced operating costs (Raffai et al 2012). As such, banking institutions are seeking to gain competitive advantage by using ICT to develop their E-Banking offerings. Banking institutions in many developed countries have managed to adopt and adapt internet technology in a timely and relatively successful manner, yet there is still a degree of resistance. So, the challenge for banks is to encourage or at least understand the influence of the internet as a connection between customers and bank services (Daniel 1999; Sathye 1999). As such, banks face the enormous challenge of balancing customer satisfaction and fierce competition of market penetration (Tiwari 2013), with a committed to the betterment of the quality of services. In China, the context of this study, the adoption of E-Banking seems more widespread, perhaps due to the need for remote banking services (Research and Markets 2010) a trend seen clearly in India (Raghavan 2006). This makes China an interesting basis to explore with a degree of maturity and unique cultural context. In accordance with the statistics by China’s Electronic Bank (China Internet Watch 2012), about 300 million of Chinese customers were using E-Banking in the first half of 2012. The worldwide scope of the usage indirectly implies that E-Banking has its unique strengths to bring new vitality to the banking sector and means new insights may be gleaned from a market familiar with the concept of E-Banking and the experiences and perceptions they hold.

In exploring the market, it is worth considering some of the generic issues associated with technology adoption including concerns about the potential unacceptability, security risk and higher initial cost of development (Wu et al. 2006). (Pritchard 2013) highlights that many customers, especially the house holders, have no patience to wait for the relatively slow transactions due to the slow speed of Internet connection. This is also an obstacle for many companies who need to trade online. Even for those who have shown proficiency in using computers, it is difficult for most to comprehend how to use E-Banking efficiently, especially the detailed steps of registration (Joseph 2013) and technology enabled support services (Cornell 2013). These points are clearly pertinent to the Chinese market and as such will be explored more fully in later stages of the paper. Besides these issues, security risk is also an unavoidable problem and major influence on consumer confidence. While the websites of online banking have been much safer than before, Internet criminals can still attack the protecting system in increasingly sophisticated ways (Hubpages 2013). According to (Hyde 2012), 25 million of E-Banking customers are put at risk by hackers when the new generation of security systems crashes. There is evidence of the increasing degrees of fraud. In 2007, E-Banking fraud resulted in a loss of £ 22.6 million, compared to £ 52.5 million in 2008, £ 58.7 million in 2009 and £46.7 million in 2010 (Hyde 2012). In the first half of 2011, the serious problem seemed to be better controlled while there was still a totalled £ 16.9 million of loss (BBC 2012). The statistics coincide exactly with the concerns of E-Banking users that security, especially the individual identity, is deemed as a hidden danger (Cornell 2013). This is therefore an area integral to the exploration of drivers of adoptions and is embedded within the hypothesis and framework developed in the paper.

Although E-Banking has helped in growing number of customers due to the obvious advantages, the limitations mentioned above can negatively affect the adoption of E-Banking among both users and potential users. Specifically, a satisfied customer can help E-Banking providers maintain and enhance their competitive advantages, as well as providing positive recommendations to their relatives or friends so that the customer base will expand. Conversely, the concerns can lead to the dissatisfaction of E-Banking customers and subsequent refusal to adopt the technology. Irrespective of the pros and cons of E-Banking, it is nevertheless considered as one of the major innovation in banking industry. Banks across the world have invested in E-Banking services with the intention of reducing costs and improving efficiency. Chinese banks have followed their international peers and have developed E-Banking initiatives with an intention to better service their customer base. Within an academic context, while much research has been done in E-Banking, China unfortunately has not been predominantly looked at. With its rapid industrial growth and an ever increasing infrastructure, it is expected that China would emerge as the largest single economy in the near future. Huge capital investment and infrastructure development have been prioritised and the Chinese financial services industry has been funding this growth. Banking services form one of the main backbones in China's drive to develop its economy and the increased investments has resulted in wealth generation in its inner provinces. Chinese provinces have experienced tremendous growth and have become important bases for economic development. Although many Chinese provinces have experienced growth and development, none is as impressive as the Shandong province. The region has a population of 92 million and is home to 17 cities and 24 harbours (China SignPost 2015). Its GDP in 2009 was \$511 bn. comparable to national economies of Switzerland (\$491 bn.) and Indonesia (\$540bn.). It is also the home to 34 banking institutions and 24 national insurance companies and is one of the important import and export destinations in China. Given the sphere of influence both financially and as a fertile region for the growth of Internet related business initiatives, it is surprising that little research has been carried out in this province.

In the Shandong province, E-Banking sector is still in its primary stage of development and as one of the major provinces for developing financial industry in China, at present, according to government reports, the province has achieved a 40 % internet penetration rate and it expected to grow at the rate of 6.7 % in the future (Ministry of Commerce of PRC 2015). Shandong Province is one of the fast growing regions in China and the banks in the province have rolled out online initiatives but there is little information on whether their efforts have been successful. Since the banks providing E-Banking services in Shandong Province can also be influenced by problems mentioned above, it is important that research be undertaken in context of the province to fill the academic gap and understand whether theoretical frameworks like the Technology Acceptance Model (TAM), can be extended in explaining the E-Banking adoption issues in China. Consequently, the overarching aim of this paper is to address the factors influencing customers' adoption of E-Banking in China, especially in Shandong Province, and in doing so, to identify the factors encouraging or dissuading customers' adoption of E-Banking in Shandong Province, China.

## **2. THEORETICAL BACKGROUND**

Within E-Banking, scholars have been trying to understand the factors that underpin the adoption of E-Banking among consumers. (Kolodinsky 2004) notes that basically, the widespread usage of E-Banking is predominantly determined by the relative advantages of the system; while the obstacle is closely associated with computer proficiency (Mattila et al. 2003). According to (Poon 2008), the results drawn from a questionnaire investigation with 324 valid responses indicated that the speed of service was critically important for consumers' decision of using E-Banking in Malaysia. Compared with the traditionally manual service, the electronic transactions rendered it possible for users to avoid taking time to travel to the bank and waiting for further banking transactions. Extending from the merit of time

saving, it has been proved that E-Banking was an effective way to prevent the impact of uncertainty. Using a random sample within the customer base of 26 licensed banks in Jordan, (Al-Smadi 2012) revealed that uncertainty avoidance exerted a significantly positive influence on perceived usefulness and perceived ease of use in relation to online banking. Similar conclusion has also been summarised by Ismail and (Ismail and Osman 2012), who found that due to the limitation of time and space of traditional banks, as well as the flexibility of dealing with unexpected situations, E-Banking was satisfactory for many customers and has been widely accepted by a growing number of people in Sudan.

Apart from looking at influencing factors, research has also focussed on barriers that prevent consumers from adopting E-Banking initiatives, (Shamim and Sardar 2010) in their work with Pakistani customers found that lack of computer knowledge was one of the main issues preventing people from utilising E-Banking services. Similar results were also found in the study conducted by (Mattila et al 2003). In their large scale study among mature customers in Finland, they found that perceived difficulty in using computers was viewed as the main obstacle of the acceptance of Internet banking. Mature customers were also featured in a study conducted by (Rose and Fogarty 2006). Their study on senior citizens noted that lack of technological knowledge was one of the core issues that determined the perceived ease of use and its indirect influence in the uptake of self-service banking technologies. The importance of Internet skills was further also mentioned as one the main influencing factors in consumers preference to use E-Banking services in Tunisia (Nasri 2011)

### 2.1 Framework

Based on the evolution of the Theory of Reasoned Action (Ajzen and Fishbein 1980), the Technology Acceptance Model (TAM) was initially proposed by (Davis 1989) illustrating how people’s adoption of a new technology was influenced by external factors. Figure 1 shows the two main determinants affecting people’s attitude and the intention to use a new system. The determinants have a strong effect on their actual technology use and application. TAM has been widely employed to ascertain the reasons for people’s usage of new computer technologies (Davis et al. 1989). While determinant perceived usefulness refers to the extent to which people believe a new application can help to improve their performance, the determinant perceived ease of use focuses on how hard the new technology can be applied by people (Davis 1989). A more simplified was presented by (Venkatesh et al. 2003), which directly links the actual use of the systems to perceived usefulness and perceived ease of use (Figure 2).

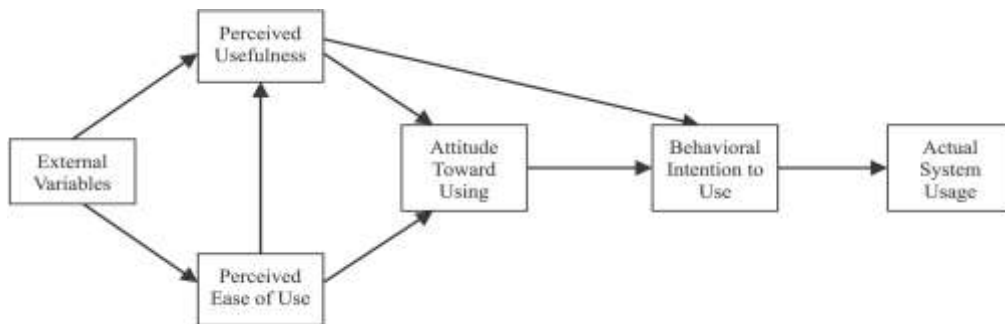


Figure 1: TAM (source: Davis et al. 1989, p. 985)

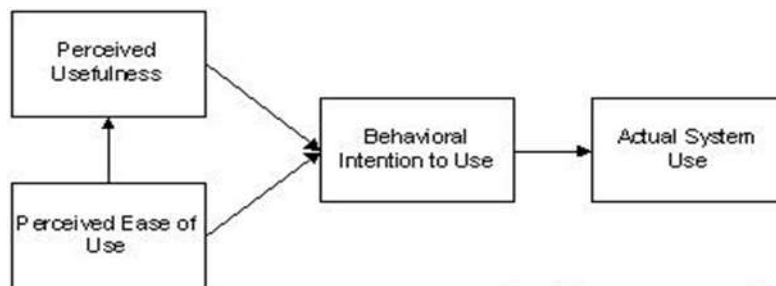


Figure 2: Simplified TAM (source: Venkatesh et al. 2003, p. 446)

Taking both self-efficacy and outcome beliefs into account, the Self-efficacy Theory indirectly proved that perceived usefulness and perceived ease of use together dominated people's behaviour (Bandura 1982). Specifically, self-efficacy was defined as the assessment of how well a person can execute actions that were of vital importance to address forthcoming situations; while outcome judgement was concerned with the extent to which a successfully performed behaviour was believed to be connected with valued outcomes. According to (Bandura 1982), self-efficacy and outcome judgement were respectively similar to perceived ease of use and perceived usefulness. (Hill et al. 1987) extended Bandura's findings and revealed that both self-efficacy and outcome judgement exerted an influence on people's decision to accept an innovation and to learn a computer language. Generally, by focusing on self-efficacy beliefs and outcome judgement, the self-efficacy paradigm indirectly theorised that perceived usefulness and perceived ease of use played a dominant role in users' behaviour.

Channel disposition model, another supportive theory, revealed the relationship between perceived usefulness and perceived ease of use from the perspective of information quality and information access (Swanson 1982; Swanson 1987). Specifically, potential users' selection of information was fundamentally based on the trade-off between attributed information quality and associated cost of information access, which could be paralleled to the adoption of computer technologies. Inspecting (Swanson 1987), it can be noted that the value to the selected information was similar to perceived usefulness; while the convenience of accessibility and the controllability of the information suggested a close correspondence to perceived ease of use. Basically, the relevance between information selection and system adoption indicated that there was a strong link between the two factors of TAM, which implied a balance between both elements had a far-reaching influence on users' behaviour and actual use.

Similarly, extended from Behavioural Decision Theory (Beach and Mitchell 1978; Johnson and Payne 1985; Payne 1982), the Cost-benefit Paradigm also noted the connection between perceived usefulness and perceived ease of use. Dissected people's choice among decision making strategies, it was noticed that the balance between the effort made to execute the strategy and the accuracy of the result of the decision were key points in the strategy selection. This was also applicable to the usage of a new system. In the context of actual system usage, the equilibrium between perceived usefulness and perceived ease of use were determined as prominent factors in the decision of the acceptance of a new computer technology (Venkatesh et al. 2003). In general, the determinants perceived usefulness and perceived ease of use have been used to explore the people's willingness to adopt technology (Venkatesh et al. 2003) and their embedding in a framework like TAM has made it easier to study behavioural intentions and its transformation to actual systems usage. In recent research, however, TAM has come under criticism, because of over simplification (Amin 2007; Chong et al. 2010). Moreover, there have been questions whether the area of technology adoption has anything new to offer and whether there was any merit in continuing technology adoption research (Venkatesh et al. 2007). However recent research has suggested that the topic is well alive and further development can be achieved by focusing on research directions that can leverage on current understanding and knowledge in the areas of innovating processes (Plewa et al. 2012).

In the context of this paper, specifically with the focus on Shandong Province in China, we will adopt the simplified TAM as a starting point and extend it with two additional constructs to guide further research. As shown in Figure 3, the two original constructs, perceived usefulness (PU) and perceived ease of use (PEOU), will be retained as the basis, combining with another two variables — perceived credibility (Pcred) and perceived cost (Pcost), which are viewed as potential determinants in this situation.

### **2.1.1 Perceived usefulness (PU)**

According to (Davis 1989), perceived usefulness was defined as the degree to which a person believed that the adoption of a new technology could enhance his/her performance. As one of the fundamental elements of TAM, it has been evidenced in a large amount of extensive research that perceived usefulness had a significant influence on people's intention of information system usage.

The relationship between perceived usefulness and behavioural intention has been tested from the perspective of genders and regions. Conducting a longitudinal research experiment among 342 participants in relation to the introduction of a new software system, (Venkatesh and Morris 2000), illustrated that the perceived usefulness had a stronger positive effect on men's technology usage decision, contrary to women whose adoption of the technology is not significantly affected by PU. However, unlike the distinct gap between genders, the results from the research among geographical regions showed that perceived usefulness was a significant factor in relation to the adoption of new technology. For example, (Wu et al. 2010) in their study of Taiwanese banks web services stated that perceived usefulness, which had a strong link with a series of other factors including the quality of E-Banking website and

relevant information, played a positively critical role in Taiwanese customers' intention of the adoption of online banking. Similar conclusions were also drawn by (Safeena et al. 2010), they pointed that perceived usefulness, which was essentially important to users' intention of applying information and communication system, had a positive influence on people's adoption of Internet banking in India.

Perceived usefulness is a significant factor in the TAM model, and research has shown that it can play an important role in the adoption of new technologies, in the study of E-Banking in the Shandong province in China, it is hypothesised that this construct will an important role in the local population's engagement with banking technologies and consequently, we propose that

H1. Perceived usefulness has a strongly positive influence on consumers' intention of the adoption of E-Banking in Shandong Province, China.

### **2.1.2 Perceived ease of use (PEOU)**

As mentioned above, (Davis 1989) defined perceived ease of use as the degree to which a person believes it was easy for him/her to adopt a new technological system. Like perceived usefulness, the significant influence exerted by perceived ease of use on people's behavioural intention of the acceptance of a new system has recently been proved by many researchers. For example, (El-Kasheir et al. 2009) demonstrated that perceived ease of use was the strongest predictor to keep customers' continued acceptance of Internet banking in Egypt; in contrast to perceived risk, which showed no links with people's intention of the continued usage of Internet banking. Analogous results can also be drawn from (Roy et al. 2011), in their analysis of the data garnered from 100 customers of Dutch-Bangla Bank Ltd, it was found that perceived ease of use was one of the main determinants positively affecting peoples' choice to apply online banking, followed by security and privacy and information available on the online banking website. From the indirect perspective, perceived ease of use has been shown to influence people's intention to use E-Banking via PU. (Jin and Kim 2013), in their study demonstrated that perceived ease of use was the only factor positively influencing the adoption of communication-oriented services (COS) and transaction-oriented services (TOS). Their study also noted that PU played an indirect role linking PEOU with technology adoption. Similar results were also drawn by (Altun 2012), in his study of Cyprus banks, he clarified that perceived ease of use upon perceived usefulness; and perceived ease of use and perceived usefulness upon the intention to use respectively had a positive effect on people's adoption of Internet banking. Perceived ease of use is a useful construct in understanding people's intention to use newer technologies and it is expected that it will also play a role in the adoption of E-Banking services in the Shandong province in China. Based on its influence the following hypothesis is proposed,

H2. Perceived ease of use has a strongly positive influence on consumers' intention of the adoption of E-Banking in Shandong Province, China.

### **2.1.3 Perceived credibility**

Undeniably, without the certain trust of a new technology, it can be arduous for customers to accept the new system. Hence, besides perceived usefulness and ease of use, perceived credibility regarding security and privacy has been concentrated as another important construct affecting people's adoption of E-Banking (Wang et al. 2003). Generally, perceived credibility has been conceptualised and explored to exert a strong influence on E-Banking acceptance of both institutional and individual users. Work done by (Riyadh et al. 2009) and (Jalal et al. 2011) has shown that perceived credibility has an impact on people's intention to employ Internet banking. In conjunction with other factors, lack of perceived credibility has been treated as the main source of individual customers' dissatisfaction of E-Banking services, which indicated that perceived credibility had a positive effect on E-Banking usage.

Related to credibility are the potential security risks of the system and the protection of private data. Security and privacy risks have been identified as influential factors in people's adoption of Internet banking (Safeena et al. 2010). Works done in Zimbabwe, Australia, Malaysia and India have highlighted that security and online safety privacy issues were the most important decision making factors in relation to use E-Banking services (Ochuko et al. (2009), (Muzividzi et al. 2013), (Yeow et al. 2008), (Geetha and Malarvizhi 2011). Security concerns stood out to be the impediment to the usage of Internet banking and failure of the banks to quickly respond to security issues was seen to have a negative impact in relation to the use of online banking services (Sathye 1999). In addition, academic insight drove researchers to find the role played by privacy. By inspecting four dimensions of the critical success factors of the adoption of electronic banking, a deductive research was conducted with Malaysian banking customers. Demonstrating

the highest effect on electronic banking usage, privacy concerns and customers' trust were highlighted as the top two significant drivers for the successful adoption of electronic banking (Sohrabi et al. 2012). Due to the worldwide impact of perceived credibility on the adoption of E-Banking, it is rational to propose the following hypothesis:

H3. Perceived credibility has a strongly positive influence on consumers' intention of the adoption of E-Banking in Shandong Province, China.

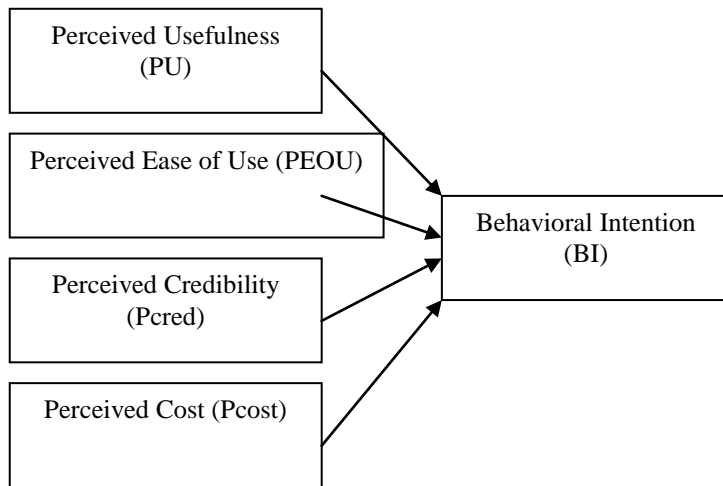
#### **2.1.4 Perceived cost**

Apart from perceived credibility, perceived cost is also deemed to be a potentially significant and influential determinant in the adoption of E-Banking. In accordance with (Burnham et al. 2003), perceived cost of E-Banking should be comprehensively considered from three perspectives, namely procedural, financial and relational cost, rather than solely viewed as financial cost. According to (Burnham et al. 2003), procedural cost is mainly referred to the expenditure of time and effort comprising the cost of set up and learning. Users of online banking facilities have complained about the complex and time consuming process of setting up, downloading and satisfying the login credentials involved in user authentication processes (Lichtenstein & Williamson 2006). After all the procedures, it usually took amount of time for users to familiarise with the system, including reading relevant document of use agreement and learning how to operate. This could fully explain the phenomenon explored by (Ismail and Osman 2012) that only those with computer and Internet literate were willing to attempt E-Banking, which implied that procedural cost was one of the key blocks of the adoption of E-Banking.

Financial cost in this context, is defined as the cost of financially quantifiable resource (Burnham et al. 2003), which could be specified as the charges incurred by computer purchase, Internet access and E-Banking transactions. People who earned little money feel that there was a lack of need for them to adopt such an advanced technology since it could only be available with a qualified computer and the accessibility of Internet, let alone the potential cost of updating the computer (Lichtenstein and Williamson 2006; Fonchamnyo 2012). With traditional channels still available for banking transactions, customers do not see the need to incur additional expenditure in relation to the buying and setting up of computer and Internet services. Since the same effect could also be achieved in the traditional way, financial cost greatly hindered the acceptance of E-Banking (Alagheband 2006). In addition to the cost of time, effort and money, rational cost particularly involving psychological and emotional discomfort in terms of loss of personal relationship has been determined as a factor in the adoption of online banking services (Burnham et al. 2003). For many customers, a personal face to face relationship based on mutual trust is of vital importance; this interaction would be lost in E-Banking and may lead to trust issues (Lichtenstein and Williamson 2006). This lack of personal interaction and the associated mutual trust is depicted as one of the main deficiency in the adoption of E-Banking. In relation to the hypothesis development this also suggests that rational cost has an evident effect on the adoption of E-Banking and should be essentially dealt with. In terms of the three perspectives, it has been ensured that perceived cost is a significantly negative determinant of the adoption of E-Banking. However, since the specific cost of E-Banking is regionally different, whether it is adaptable to Shandong Province, China is unknown. To explore the relationship between perceived cost and the intention of utilising E-Banking, the hypothesis has been proposed as follows:

H4. Perceived cost has a strongly negative influence on consumers' intention of the adoption of E-Banking in Shandong Province, China.

In line with the explanation of the constructs and the corresponding hypotheses above, the research model for this study is therefore established on the basis of the modification of the TAM.



**Figure 3: Proposed Model**

### 3. METHODOLOGY

In line with the research questions and objectives, as well as previous literature review, relevant research methodology was carefully conceived in order to achieve the purpose of the research. Research in this paper was based on both inductive and deductive approaches. They were respectively employed to construct new theories and to test the hypotheses. Primarily, this research sought to identify the links between the influential factors and people's behavioural intention in the adoption of E-Banking, especially from the respondents in Shandong province, China. Hence, an inductive approach was essentially applied in this research. On the other hand, due to the necessity of examining the hypotheses regarding whether the factors proposed in accordance with the theoretical framework are significant to the targeted populations, a deductive approach including some positivism elements was undertaken to complement this research (Saunders et al. 2007).

In the light of the aforementioned approaches as well as the research objectives, both experiment and survey were employed as the strategy of this research. Given the demand for basic data in solving the key research problem, two research techniques, questionnaires and semi-structured interviews, were respectively adopted to gather data. Specifically, questionnaires were distributed and garnered electronically, as well as interviews, which were also conducted via the Internet. In accordance with the research purpose, residents in Shandong Province, China, aged from 20 to 60, were chosen as the targeted populations since this cluster of people are more likely to use E-Banking and have a demand for banking services. Particularly, as the survey was essentially conducted via the Internet, most of the participants were Internet users with at least basic networking skills.

In addition, given the necessity to identify the barriers to E-Banking, non-users of online services were also targeted to understand their perspective. Accordingly, users who are aged from 20 to 60, including both E-Banking users and non-users were targeted. A sample of 200 potential respondents was randomly selected through the Shandong telephone directory. They were asked for permission to take part in the survey and were directed to a professional survey website, where the survey questionnaire was uploaded. In this way, the inconvenience for directly distributing the questionnaires to the targeted sample was avoided and the randomness of the sample selection could be ensured to a maximum extent. 84 questionnaires were gathered from the online source overall, among which 55 were from the users who are now utilising E-Banking services, and 29 from the non-users, consisting of 11 previous users and 18 people who have never applied E-Banking services so far. In addition, four more non-users, comprising two previous users and two people who never used E-Banking, were respectively interviewed via the Internet. However, 32 of the questionnaires were invalid as the respondents are neither the residents of Shandong Province, nor in the qualified age range. Consequently, those correspondingly responses were eliminated. Therefore, the totally usable questionnaire responses are 52.

On the basis of the research questions and objectives, as well as the research strategy, a structured questionnaire was carefully designed with two sections. Specifically, the first section, which consists of seven multiple choice questions, aimed at collecting both demographic (question 1-5) and basically behavioural data (question 6 and 7) from the respondents. Particularly, question two and three mainly functioned in filtering the valid ones from all the questionnaires. The second section, which was the principle part of the questionnaire, sought to verify the significant factors influencing the adoption of E-Banking, in accordance with the hypotheses and the research model constructed before. In line with the



Five-point Likert Scale, questions in this section essentially required the respondents to choose to what extent they agreed with each item from “strongly agree” to “strongly disagree”. Particularly, items for each question were cautiously adapted from prior studies. Perceived usefulness with three items was adapted from (Wang et al. 2003). Perceived ease of use with two items was adapted from (Nysveen et al. 2005). Perceived credibility with two items was adapted from (Pikkarainen et al. 2004). Perceived cost with three items was adapted from (Lichtenstein and Williamson 2006). Before the administration of the actual questionnaire, it was pilot tested to make sure the questionnaire was accurate and understandable.

In accordance with the research objectives, in depth semi-structured interviews was undertaken among 4 volunteers to gather more qualitative data for the intensive analysis of customers’ resistance of E-Banking. Since it is difficult to acquire enough qualified sample from UK, a snowball technique was adopted in the sample selection. While the first two interviewees were randomly chosen, the other two were contacted by the first two participants. All the interviews were undertaken in Chinese through the chatting software QQ; and each of them lasted approximately 30 minutes. Based on the 6 open-ended interview questions, all the interviewees were encouraged to talk about their attitudes towards E-Banking. After that, those who had utilised E-Banking were asked to recall the reasons why they decided to apply E-Banking and why they quit using it; while those who had never tried E-Banking were requested to describe their expectation and anxiety if they accepted E-Banking. Obtaining the permission from the interviewees, information was recorded automatically by the computer. Also, notes were taken immediately recording the key points. Due consideration to confidentiality and anonymity was followed during the interview process and permissions were taken when there was a necessity.

In order to resolve the research questions, quantitative and qualitative data were respectively collected and then analysed statistically and descriptively. Aiming at testing the proposed hypotheses and identifying the significant influencing factors of E-Banking adoption, a regression analysis was undertaken. Corresponding tables and diagrams were generated to intuitively illustrate the statistics from quantitative analyses. Moreover, the data garnered from interviews was transcribed into English and saved as separate word-processed files and further processed on the basis of classification and comparison. The results are described in the following section.

#### **4. FINDINGS**

As is shown in Table 1, the profile of respondents is shown with different demographic characteristics. The ratio of both genders is almost equal; given the 55.8% of the male respondents and 44.2% are female respondents. Most (40.4%) of the respondents are aged from 21 to 30, following 23.1% from 31 to 40, 21.2% from 41 to 50, and 15.4% from 51 to 60. By monthly income, majority of the respondents are in the middle class level, among which over 40% (42.3%) earn 3001 to 6000, 11.5% earn 6001 to 10000, and 3.8% earn over 10001 RMB per month; while the rest 42.3% will earn no more than 3000 RMB every month. As for highest degree, 38.5% of the respondents own a Bachelor’s degree, followed by the equal ratio (23.1%) of those with college and high school or lower degree. For the rest, 7 people (13.5%) own a Master’s degree; while only 1 person (1.9%) has a Doctor/al or higher degree.

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	29	55.8	55.8	55.8
	Female	23	44.2	44.2	100.0
Age	21 to 30	21	40.4	40.4	40.4
	31 to 40	12	23.1	23.1	63.5
	41 to 50	11	21.2	21.2	84.6
	51 to 60	8	15.4	15.4	100.0
Monthly Income	Less than 1000	7	13.5	13.5	13.5
	1001 to 3000	15	28.8	28.8	42.3
	3001 to 6000	22	42.3	42.3	84.6
	6001 to 10000	6	11.5	11.5	96.2
	More than 10001	2	3.8	3.8	100.0
Highest Degree	High school or lower	12	23.1	23.1	23.1
	College	12	23.1	23.1	46.2
	Bachelor	20	38.5	38.5	84.6
	Master	7	13.5	13.5	98.1
	Doctor or higher	1	1.9	1.9	100.0

#### 4.1 Current situation of E-Banking adoption

As can be seen by the statistics from the sample population, it appears that E-Banking adoption has only achieved a medium level of development in Shandong Province. Table 2 both show the situation of E-Banking utilization among the 52 questionnaire respondents. As is illustrated, although most of the respondents (63.5%) are now regularly using E-Banking, almost forty percent of people (36.5%) are complete non-users of E-Banking even though some of them were previously engaged with online banking services. Particularly, it is notable that there are nearly one-fifth of people (19.2%) who have never used it before.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I am now using E-Banking	33	63.5	63.5	63.5
	I used to use E-Banking, but am not using it now	9	17.3	17.3	80.8
	I have never used it before	10	19.2	19.2	100.0
	Total	52	100.0	100.0	

However, the respondents' level of the knowledge of E-Banking services is much worse than the real E-Banking uptake. Table 3 both illustrate the respondents' knowledge of E-Banking. As can be seen, although all the respondents have at least heard of E-Banking, only 13.5% of people know it very well. Majority of the respondents (55.8%) acknowledge that they just know something about E-Banking but do not quite familiar with it. Also, there are over thirty percent of people only heard of E-Banking but know little about it.

**Table 3: Knowledge of E-Banking**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid I know it very well	7	13.5	13.5	13.5
I know something about it, but not very well	29	55.8	55.8	69.2
I just heard of it, but I know little about it	16	30.8	30.8	100.0
Total	52	100.0	100.0	

Further, the disappointing knowledge level and the adoption of E-Banking could be further illustrated by Table 4, a more specific cross tabulation between respondent utilization and knowledge of E-Banking. From Table 2, it can be seen that almost eighty percent (23) of the 33 E-Banking users do not know E-Banking very well, let alone the non-users, none of who know it very well. Furthermore, it is also important to notice that some people (3) just know little about E-Banking, even though they are the regular E-Banking users. The only consolation is that no one will abandon using E-Banking if they know it very well.

**Table 4: Utilisation of E-Banking and Knowledge of E-Banking Cross Tabulation**

		Knowledge of E-Banking			Total
		I know it very well	I know something about it, but not very well	I just heard of it, but I know little about it	
Utilisation of E-Banking	I am now using E-Banking	7	23	3	33
	I used to use E-Banking, but I am not using it now	0	4	5	9
	I have never used it before	0	2	8	10
Total		7	29	16	52

#### 4.2 Significant factors influencing customers' intention to use E-Banking

In order to test the proposed hypotheses and further ascertain the potential significant factors influencing consumers' intention to adopt E-Banking in Shandong Province, a regression analysis was conducted in line with the statistics from the questionnaire survey. Specifically, in accordance with the research model, four possible significant factors – perceived usefulness (PU), perceived ease of use (PEOU), perceived credibility (Pcred), and perceived cost (Pcost) – are set as the independent variables, while the behavioural intention to use E-Banking is defined as the dependent variable. Further, based on the code which respectively marked “strongly agree” to “strongly disagree” with the score “5” to “1”, arithmetical means were calculated among the assessment items to assign values to the corresponding variables. Based on this data, a multiple linear regression was undertaken by SPSS to preliminarily model the relation between the independent variables and the dependent variable, the results of which are shown in the following tables.

Table 5 provides the results of the regression analysis, the Adjusted R Square value is 0.741, which means the four independent variables can explain 74.1% of the variability in the respondent intentions to adopt E-Banking.

**Table 5: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.873 <sup>a</sup>	.761	.741	.69806

a. Predictors: (Constant), Pcost, PU, Pcred, PEOU

b. Dependent Variable: Behavioural Intention to use E-Banking

To ensure certain validity and reliability of the whole mathematical model and the regression coefficients in the model equation, F-test and t-test were undertaken on the basis of the results presented in the Table 5 and Table 6. Firstly, as seen from Table 6,  $F = 37.503$  and the  $Sig. = 0.000 \leq 0.05$ , which indicates that the model is significant as a whole. Furthermore, as can be seen from Table 7, which provides the t values and the corresponding Sig. values of all the independent variables. As can be seen, PU and Pcred are significant variables as their Sig. values are all lower than 0.05. However, as the Sig. value of PEOU and Pcost are higher than 0.05, they are not significant in the model, which suggests that PEOU and Pcost cannot be regard as significant factors influencing consumers' intention to use E-Banking in Shandong Province.

**Table 6: ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.098	4	18.274	37.503	.000 <sup>a</sup>
	Residual	22.902	47	.487		
	Total	96.000	51			

a. Predictors: (Constant), Pcost, PU, Pcred, PEOU

b. Dependent Variable: Behavioural Intention to use E-Banking

**Table 7: Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.865	.534		-1.622	.112
	PU	.718	.179	.552	4.017	.000
	PEOU	.182	.157	.149	1.153	.255
	Pcred	.358	.159	.238	2.249	.029
	Pcost	-.056	.103	-.041	-.541	.591

a. Dependent Variable: Behavioural Intention to use E-Banking

Moreover, in accordance with the co-efficient values presented in Table 7, the model equation can be established as: Behavioural Intention to use E-Banking =  $-0.865 + 0.718 PU + 0.182 PEOU + 0.358 Pcred - 0.56 Pcost$ . In this model, two variables, PU and Pcred, are identified to be significant factors which have a positive influence on consumer intentions to adopt E-Banking in Shandong Province. Therefore, it can be stated that H1 and H3 are supported. On the other hand, it is revealed that PEOU and Pcost respectively has a positive and negative influence on consumers' intention to use E-Banking, but they are not significant factors, so H2 and H4 are disproved.

### **4.3 Reasons hindering consumers' adoption of E-Banking**

In order to identify the main reasons hindering consumers' adoption of E-Banking, 4 interviews were conducted to obtain further information. In accordance with the findings from the interviews, the reasons can basically be categorised into three themes, difficult to operate, unnecessary to use it and worry about the security. The difficulty of the operation bears the brunt of the resistance of E-Banking which bothers all of the four interviewees. Specifically, Interviewee A felt that the traditional banking is more convenient since E-Banking is "cumbersome to operate it, let alone to be skilful of it". He also said that he preferred to use the traditional banking which made him feel at ease. Although at times he wanted to use E-Banking, but it only happened when it was an emergency. Similar description emerged in the interviews with Interviewee B and C. For example, Interviewee B, she said,

"...it takes amount of time to queue for the banking transactions in the way of traditional banking, but the thing is I am familiar with the handling process. Although E-Banking is not limited by the time and space, I am rusty about the handling process of business; it is too complicated to operate."

For Interviewee C, although she acknowledged the advantages of E-Banking, she still did not use it. She said,

"Traditional banking may not be as convenient as E-Banking, but it is a more common way and easier for people to accept. E-Banking is much more flexible, but sometimes, people may feel it just complicate the process of the banking business...Also, I am not skilful in operating computer, so I have to be very careful while using E-Banking in every single step. It is just too difficult and complex to learn and understand how to use it."

Particularly, such difficulty can be exaggerated for old people. For example, Interviewee D who is aged at 60 believed that people in her age were impossible to use E-Banking since they were inept at operating computers or the Internet, let alone to learn a completely new modern technology.

Further, the difficulty of the operation leads to another reason impeding consumers' adoption of E-Banking, which is "unnecessary to use it". Specifically, this problem mainly results from the narrower business coverage of E-Banking. Interviewee B thought that since the traditional banking could achieve all the role E-Banking plays, and was even more functional, there was no necessity to learn how to operate E-Banking. Interviewee A provided with an analogous answer. He said that since E-Banking was hard to master and he was familiar with the traditional banking, he did not want to spend so much time and effort learning a similar but more complicated way. For the other two respondents, they did not think they would use E-Banking regularly even though they had learnt how to use it. Particularly, Interviewee C who used E-Banking previously told the researchers that she used to utilise E-Banking only a few times every month, so she felt it was a waste of time to learn or even master it. For Interviewee D, who had never applied E-Banking, said,

"...it is unnecessary for me to use E-Banking...most of my banking businesses were done by my daughter. Sometimes, I have to handle it by myself...like getting the pension. But it cannot be conducted on the Internet. So, I do not think that E-Banking can play an important role in my life...What I expect the most is the home services. If I want to use E-Banking, I hope that someone can help me at home so that I can get quick response if necessary, and I do not have to go to the remedial classes, I can stay at home...If so, that will make me comfortable, and then, I may consider learning and using it."

Except for the two reasons mentioned above, some interviewees are also concerned about the security of using E-Banking. They did not think that the bank was credible enough to avoid the security problems. Specifically, Interviewee A, who treated the high level of security as the preliminary condition to use E-Banking, said,

"I mainly and really worry about the security of the system...although the bank would assure you that they will keep your individual information confidential and it is totally secure to use it, I still worry about it...I just felt that if it is safe, why would there still be so many E-Banking personal information crimes?"

Similarly, Interviewee C said,

"For me, by the impact of the traditional concept, only when I have to will I use E-Banking. Otherwise, I would rather use traditional banking. I did not feel at ease when I used E-Banking. This is an insecure way for me since I am a relatively conservative person. I felt it was much safer to conduct those banking transactions in the traditional bank as I could get immediate help from the professional staff. Now, although I have the USB Key and can operate by myself, I still prefer to go to the bank and ask the staff to operate it in

their computers. I am really concerned about the operational errors which may lead to unnecessary loss and trouble.”

In addition, another important result was summarised from the answers of the first two questions. For all the interviewees, their understanding of E-Banking is either one-sided or too broad. Specifically, Interviewee B and C spoke about E-Banking only from the perspective of transferring money. Interviewee B thought that E-Banking was to transfer account or to pay the money through the Internet aiming at making consumers feel convenient. While Interviewee C regarded E-Banking as the remittance business which is conducted through the online bank or the ATM machines. Moreover, Interviewee A and D provided with similar answers, in which E-Banking was treated as the bank which is operated through the modern informational devices, like computers or mobile phones. Given that some of them acquired the knowledge from the banks’ professional staff, this negative result was even more disappointing.

## 5. DISCUSSION

### 5.1 Significant factors influencing customers’ adoption of E-Banking

Based on the linear regression analysis, it has been proved in a formula that Behavioural Intention to use E-Banking =  $-0.865 + 0.718 PU + 0.182 PEOU + 0.358 Pcred - 0.56 Pcost$ , while hypotheses H1 and H3 are validated, and hypotheses H2 and H4 are refuted, indicating a relationship between the four potential influential factors and customers’ intention to adopt E-Banking.

First, with a remarkable consistency of the results revealed by (Wu et al. 2010) and (Safeena et al. 2010), perceived usefulness was identified as a significant factor that positively influences consumers’ intention to utilise E-Banking. Particularly, since PU is align with the greatest coefficient value of 0.718 among other regression coefficients; it can be regarded as the strongest influential factor, which will further validate the conclusion drawn by (Wu et al. 2010). This finding indicates that the true usefulness and real value of E-Banking takes priority over other factors when most people consider whether to adopt it. Consumers are more likely to use E-Banking if they perceive that it is really helpful. In other words, once E-Banking is perceived that it can only provide little value; people may lack the desire to apply it. Such rationality can easily be attributed to the demographic characteristics of the respondents. As all the respondents are aged from 21 to 60 and almost four-fifths (76.9%) of them have a college or higher education experience, they are more likely to employ the perceived value or usefulness as the first precondition to decide whether to adopt E-Banking or not.

In addition, perceived credibility was found as another significant factor which has a positive influence on consumers’ behavioural intention to adopt E-Banking. This is, to some extent, similar to the findings identified by (Ochuko et al. 2009) and (Sohrabi et al. 2012). This suggests that consumers’ awareness of protecting themselves from the potential risks of adopting a new informational technology and electronic device has been increasing. Only if E-Banking is perceived as “safe” will people have the intention to use it. Otherwise, the adoption of E-Banking is impossible. Since all the respondents are adults (aged from 21 to 60), they tends to have a stronger sense of self-protection. Also, as all the respondents are Internet users who are supposed to master more relevant knowledge and have more opportunities to use advanced technologies, they may express more anxieties about information privacy and technology security based on their own experience as well as the understanding of cybercrime. Accordingly, perceived credibility tends to be a very important consideration while choosing online banking service.

On the contrary to hypothesis H2, however, perceived ease of use was identified as an insignificant factor influencing consumers’ behavioural intention of adopting E-Banking. This finding is exactly different from the research results of many studies (El-Kasheir et al. 2009; Altun 2012), in which the perceived ease of use was proven to be one of the positively influential factors, or even the strongest factor influencing people’s adoption of E-Banking. Such result implies that consumers in Shandong Province concern little about how easy the new technology is to use while deciding whether to adopt E-Banking or not. In other words, even the system of E-Banking is greatly simplified and made easy to learn, many people may still be unlikely to utilise it. This can be understandable given the importance of the aforementioned two factors, perceived usefulness and perceived credibility. People may not care so much about the ease of use of E-Banking once the real value and the security have been confirmed, even it takes time to learn how to be skilful of the new technology. Further, due to the respondents are of different age groups, their perceptions of “easy” are different. For example, the non-users aged from 21 to 30 may feel E-Banking is easy to use, while the users aged from 51 to 60 may feel difficult. Therefore, perceived ease of use seems to be relatively insignificant to the consumers’ intention to use E-Banking in context of this research.

Moreover, as for perceived cost, it is also revealed to have an insignificant influence on hindering consumers from adopting E-Banking, which is different from the conclusion summarised by (Burnham et al. 2003), who demonstrated that people's intention to adopt E-Banking was significantly and negatively influenced by procedural, financial and relational cost. Given the different income levels among the respondents in different studies, it is reasonable that people with different income levels tend to have different perceptions of E-Banking costs. The overall income level of the respondents in this research is relatively high as nearly sixty percent (57.7%) of them earn more than 3000 RMB every month. Hence, perceived cost was regarded as another insignificant influential factor of adopting E-Banking.

## **5.2 Reasons hindering consumers' adoption of E-Banking**

Generally, this research identified three reasons of consumers' resistance of E-Banking in Shandong Province; difficult to operate, unnecessary to use it and worry about the security. Similar reasons or barriers impeding the adoption of E-Banking have also been identified by other researchers (Mattila et al. 2003; Wu et al. 2010; Jalal et al. 2011). Although these reasons are interrelated to a great extent, they can be basically explained from the perspectives of the E-Banking industry and the consumers. First, it is important to understand that E-Banking in Shandong Province is still in a primary stage, banks are lacking of experience in establishing a comprehensive and systematic service process. They are currently in the exploratory stage. Also, since the online banking system is still in its developmental stage, the employees who handle the online services are ill-trained. They lack the experience the sector demands. Their in-experience can sometimes fail to provide the adequate support required by online consumers. This may also explain the "difficult to operate" theme, where offline support is linked to the use of E-Banking facilities.

In addition, due to the ever increasing security issues and cybercrimes, reliable and secure technology as well as convenient services cannot be guaranteed, which greatly contributes to consumers' lack of confidence in E-Banking and is one of the main reasons that consumers do not want to use it. Such situation can be further intensified by external conditions. While E-Banking is still in the early stage of the development in Shandong Province, the foundation of traditional banking has been well-established for a long time. This makes it difficult for E-Banking to break and penetrate the market, let alone replace traditional practices. Worse still, banks seem unable to make an efficient promotion of E-Banking as few successful examples are worth learning. Thus, the dissemination of this service can be really slow and many people may not fully understand E-Banking, such as how functional it is and how necessary it is. Moreover, due to the traditional banking which is already a widely accepted and convenient banking service channel covering all the banking businesses, E-Banking appears to be surplus to requirements. Hence, many people may have no desire to try a new but similar channel. Specifically in this research, the respondents are mainly middle-aged or older people who are more likely to be unwilling to change and try new things, and focus more on the necessity of what they do. This seems to be accountable for why "unnecessary to use it" was cited as an important reason for E-Banking resistance among the respondents.

From the consumers' perspective, the reasons impeding consumers' adoption of E-Banking in Shandong Province can probably be understandable given both personal factors and external environment. Generally, none of the respondents showed that they knew E-Banking very well. Actually, it seems that all of them just knew it very from a very biased perspective. This may result from a lack of interaction between consumers and banks, since the main aim every time people go to banks is to process relevant banking business. They probably do not care about the new channel. They may feel that understanding E-Banking has nothing to do with them. Therefore, they may evaluate E-Banking intuitively rather than objectively. They may not really know whether it is easy to operate or not, whether it is necessary or not, or whether it is secure or not. In addition, some of them cannot readily use computers or the Internet. Therefore, the difficulty of getting proficiency in computers and the Internet may be regarded as part of the difficulty to use E-Banking. Further, their intention to use E-Banking can be strongly influenced by the suggestions from their friends and relatives. Once one person around them shows conflicting emotions, they may immediately give up the idea of trying it. These can also help explain why the three reasons of the resistance of E-Banking strongly appear.

## **6. CONCLUSION**

Generally, it has been revealed a disappointing level of the adoption and the knowledge of E-Banking in Shandong Province, while perceived usefulness and perceived credibility were identified to be the significant factors that positively influenced consumers' adoption of E-Banking. Moreover, difficult to operate, unnecessary to use and worry about the security were three reasons hindering consumers adoption of E-Banking in Shandong Province. From a theoretical perspective, we were able to extend the TAM to understand whether it could explain the adoption preferences of Chinese people, especially in Shandong province. The model was useful and consistent in explaining the more common attributes.

It also showed that Chinese people tend to view ease of use and cost investments differently than other population sets. With the statistical testing, the proposed research model and all the conclusions drawn in this research are applicable in the context of Shandong Province, China. However, the sample size restriction makes it difficult to generalize it for the entire Shandong Province and also the robustness of the model. Its appropriateness to the entire country is unknown and needs to be examined in detail due to the variations of economy, concepts of consumption and local provisions.

On the basis of the regression analysis, this research identified that perceived usefulness and perceived credibility were the significant factors that positively influenced consumers' adoption of E-Banking in Shandong Province, China; while perceived ease of use and perceived cost were revealed as insignificant factors. As for the reasons of the resistance of E-Banking, three items, namely "difficult to operate", "unnecessary to use it" and "worry about the security", were identified as the main source of the resistance to E-Banking. Further, in order to attract more E-Banking users, banks are recommended to implement strategies that focus on understanding consumer perceptions and knowledge of E-Banking.

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