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Perceived Risk and Behavioral Determinants of Using Internet Banking in Egypt

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Abstract Internet banking (IB), refers to the use of bank's web site through which users access their banking accounts and conduct financial transactions. The success of IB is determined not only by banks or government support but also by users' acceptance of it. Therefore, this research aims at examining perceived risk and behavioral determinants of using internet banking in Egypt. The research design a model based on using the original postulates of Technology Acceptance Model (TAM) perceived usefulness and perceived ease of use and introducing new factors (such as: security risk, financial risk, privacy risk, awareness, computer self-efficacy (CSE) and resistance to change (RTC)). Testing the hypotheses proposed in the research model involved developing and administering a questionnaire to a convenience 200 sample of bank customers in Egypt. The results indicate that the theoretical model provide good understanding of the factors that impact the intention to use IB. The results revealed that perceived usefulness and perceived ease to use have a positive and significant role in shaping the user's intention to use IB. All different explanatory variables are significantly correlated with the outcome variable (intention to use internet banking). The structural Equation model occurs to have a reasonable and accepted goodness of fit indices. The correlation matrix along with the structural model support all the research hypotheses.

Keywords: internet banking, security, privacy, self-efficacy, resistance to change, awareness

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1. Introduction

Advances in information technology over the past twenty years have impacted individuals as well as businesses [50]. Banks have always relied on information technology (IT) to acquire, process, and deliver its services to all relevant users [51]. As electronic commerce has grown so the electronic banking emerged to support access to banking operations and to facilitate sales and purchase transactions. Therefore, Electronic banking is the use of electronic means (e.g. ATMs, bank cards, internet banking, and telephone banking) to transfer funds or to complete financial transactions directly from one account to another [17].

The existence of internet has caused different industry sectors to change the ways they compete. The banking industry was one of these sectors that used this new distribution channel to provide various services for its clients [42]. Internet banking (IB), a form of electronic banking a true synonym of on-line banking [17] refers to the use of bank's web site through which customers access their banking accounts and conduct financial transactions. [60].

The basic services of IB include: (i) observing account balances, (ii) paying bills, (iii) transferring funds between accounts, (iv) requesting credit cards, and (v) ordering

checks [12]. The IB has several perceived benefits. These include financial benefits (e.g., lower transaction handling fees and higher deposit rate) and faster transaction speed. Moreover, IB allows users to perform banking transactions anywhere in the world and enjoy 24-hour service. [30]

The banks that own up-to date Information Technology (IT) and accounting systems have more encouraging conditions in adopting internet banking services than the banks with old internal systems. [24]. Perception of the users on the overall accounting practices followed by the bank should coordinate with their online effort. Internet bank sites should be designed to overcome personal financial problems of users and can communicate the trustworthiness of the site effectively [15]. Reference [39] in their 'research indicated that good perception about using the Internet channel for financial services encourage using it for enhancing the transparency of the financial sector.

Egypt has a great potential to benefit from the e-banking services; especially due to its high population and the expansion in the banking industry. Arab Bank PLC Egypt and Egyptian Gulf Bank were the pioneers in introducing Internet Banking systems in 2002 [35] According to the Central Bank of Egypt 40 banks work in the market 33banks have qualified websites19 licensed banks to carry out E-Banking [9]. Egyptian banks have started to compete in expanding their branch networks and

providing a variety of delivery channels such as call centers, internet banking, mobile banking, and ATMs [22].

However, a significant body of research indicated that the success of a technology is largely dependent on the individual acceptance of the new technology [27]. Therefore, there is a need to understand individuals' beliefs about technology and how these beliefs may influence the design requirements of technology-related services [59]. In addition, there is some sort of agreement that the success of IB is determined not only by banks or government support but also by users' acceptance of it. The latter has a great influence on the adoption of internet banking [1,23,32,45,58,59].

However, most of these researches have been conducted in developed countries with stable economy and considerably long history of technology adoption. Other studies were done in developing countries [34,43,47] and some have been conducted in Arab countries [1,3,4,8,38,41]. There is an urgent need to study IB adoption in developing countries with emergent economies namely Egypt. To the best of the authors' knowledge, the number of studies that addressed the factors influencing adoption of internet banking services in Egypt are limited and focused on few factors [16,25,36]. According to reference [27] behavioral intention to use a system is a key determinant of the actual use. Accordingly this research concerned with the intention of use rather than actual usage of internet banking services. This research extended the original postulates of technology acceptance model (TAM) by incorporating the most researched and significant variables that impacts IB adoption. Therefore, this research aims at examining perceived risk and behavioral determinants of using internet banking in Egypt.

2. Theoretical Framework and Hypothesis Development

IB services are quite different than information systems and the characteristics of potential adopters are likely to vary more. IB enables users from different backgrounds to implement banking transactions and financial activities in real-time [17]. The provision of IB is not adequate for competitive advantage; it is the deeper understanding of the users and their needs that can make a difference [55]. A number of implementations of IB have failed primarily because of users' low level of acceptance [27]. Several intention-based models have been developed to explain technology acceptance and use. These models include, but not limited to technology acceptance model (TAM) [13] and theory of planned behavior (TPB) [2]. These theoretical approaches have contributed to provide guidelines to enhance the adoption of internet banking services.

Reference [27] clarified that the theory of reasoned action (TRA) by Ajzen and Fishbein is an intention-based model that can be used to study behavioral intentions with regard to acceptance or use of a technology. They support that intention as the measure that motivate a person to perform a specified behavior.

The technology acceptance model (TAM) is an adaptation of TRA tailored to explain the use of information technology [59]. TAM adopts beliefs about

ease of use and usefulness as the basis for attitudes toward using a specific system, which could defines the intention to use a system that causes the actual usage behavior. Reference [13] defined perceived usefulness as the degree to which "a person believes that using the system will enhance his or her performance". On the other hand Reference [13] defined perceived ease of use, "as the degree to which a person believes that using the system will be free of mental effort".

TAM is the most widely applied model in understanding users' opinions towards acceptance of technology and significant body of research has supported it. In the study [27] a model has been proposed based on the technology acceptance model (TAM). The proposed model is an extended TAM to identify and quantify the important factors that influence adoption of internet banking technology in India. Primary data are collected using a questionnaire survey from 344 individuals who are either current or prospective internet banking users. Structural equation modeling was used to identify the important factors affecting internet banking technology adoption. The study findings reinforced that TAM is a powerful and robust model which may be used as a predictive model. Moreover, perceived usefulness, perceived ease of use, are primary determinants of the attitude toward the use of internet banking in urban India.

For example, reference [11] indicated that users are more likely to adopt IB if they perceive it to be more useful than branch banking. Reference [45] surveyed a sample of 268 to test IB acceptance among private banking users in Finland. The results indicated that perceived usefulness was one of the most important factors of IB adoption. Moreover, in the study [6] they are concerned with an empirical investigation of factors that could affect a successful internet banking services adoption such as perceived ease of use, perceived usefulness, compatibility, trust, awareness on internet banking adoption in Jordan. 517 data is used for structural equation modeling (SEM) analysis and confirmatory factor analysis. The results revealed that perceived usefulness, perceived ease of use as and trust were found to have significant positive effect on internet banking adoption.

Several studies [6,10,23,37,50,57,58,59] indicated that the greater the perceived usefulness of using IB services, the more likely that IB will be adopted. Moreover the studies done in Egypt reinforced the importance of perceived usefulness as a significant variable in the use of IB [16,25,36]. Reference [25] examined the perceived ease of use, perceived usefulness and trust as factors affecting IB adoption in Egypt for a sample of 103 respondents. The results revealed that perceived usefulness, perceived ease of use and trust are significant factors for using IB.

Therefore, the current research is adopting the TAM model to explain users' intentions to use IB and the following hypothesis is proposed.

H1: Perceived usefulness has a significant positive impact on user' intention to use IB

Similarly, several studies investigated the impact of perceived ease of use on intention to use IB and pointed out that the ease of use is significantly correlated with the adoption of IB. A study in Saudi Arabia [4] with 651 participants using survey questionnaires to examine the

different variables that may impact IB usage such as demographic variables perceived trust, perceived security, perceived privacy, e-service quality, online user loyalty, perceived complexity; relative advantage; compatibility; trialability and observability. The results revealed that perceived complexity, perceived privacy, are the most significant variables. Another study [36] done in Egypt based on one bank case study adopted TAM perceived ease of use, perceived usefulness, trust and credibility. The results indicated that perceived ease of use, perceived usefulness, are significant factors. Moreover, reference [56] concluded that perceived ease of use had a stronger influence than perceived usefulness. Accordingly, the following hypothesis is proposed.

H2: Perceived ease of use has a significant positive impact on user's intention to use IB

The majority of studies extended the original beliefs of TAM (perceived usefulness and perceived ease of use) as a base model and combined additional variables into the framework of TAM either in developed or developing countries [8,11,25,30,35,38,51,55,60]. Reference [49] identified in his analysis of 188 journal articles that covered internet banking in developing countries the most examined variables that impacts IB adoption. The highest variable was security and risk (56.9%), perceived ease of use (31.4%), perceived usefulness (26.6%). Also frequently studied computer self-efficacy (18.6%), user's behavioral control and traditions (17.0%) and Awareness (7.4%). Therefore, this research extended the original beliefs of TAM perceived usefulness and perceived ease of use by including the most important and influential variables derived and tested in previous studies done either in developed and developing countries in one single integrating research model

2.2. Risk Determinants and Perceived Usefulness

Perceived usefulness is determined, to a great extent, by perceived risks and benefits of implementing the new technology and IB service is not an exception to this [7]. The Internet is an inherently risky environment and users execute their transactions with no face-to-face contact. The users perceive IB as risky service that could cause financial, performance, social and/or privacy loss, and they perceive high concern about the consequences of using IB services [11]. Perceived risk is posited as a prominent barrier to user acceptance of IB.

Reference [3] designed a model based on the theory of reasoned action (TRA) to investigate the IB adoption in Yemen and add different factors ;relative advantage, perceived risk, mass media, family's influence, innovativeness, skepticism and technology readiness (TR). The study sample was 1,500 bank users. The results revealed that perceived risk has high significant and negative effect on users' attitude. Moreover, perceived relative advantage given the fact of the benefits of using internet banking found to be statistically significant. In addition to other significant factors ;mass media, family's influence, innovativeness, skepticism and technology readiness (TR).

Another study [16] was done in Egypt using 127 questionnaires to examine perceived ease of use, perceived usefulness, cost, and the need for interaction perceived risk and demographic. The study results

indicated that perceived risk, perceived usefulness, perceived ease of use, cost, and the need for interaction are significant factors

To provide a deeper understanding of the perceived risks of adopting IB, most of scholars claimed that user's perceived risk is a kind of a multi-dimensional construct [30]. Reference [21] indicated that the relationships among risk dimensions are complex. They classified the risk of using IB to eight dimensions. However, only three risk dimensions, namely, security, privacy, and financial risk were proven, consistently, to be significant predictors of IB adoption [21,44]. Another study highlights the fact that "security" is the biggest concern for IB users, but its scope has changed from fears about the privacy of personal information to worries of financial loss [52].

2.2.1. Security Risk

Fear of the lack of security is one of the factors that have been identified in most studies as affecting the growth and development of e-commerce [56]. Security refers to the reliability of IB and user's belief that banking transactions can be done safe and sound [33]

Security risks against IB can be through network and data transaction attacks and unauthorized account access. Both fraud and hacker attack could lead to users' monetary loss and violate users' privacy, a major concern of many Internet users [31].

Reference [41] conducted a study in Tunisia using a sample of 253 respondents for responding: 95 were internet bank users, 158 were internet bank non users. Factor analyses and regression technique are employed to study the relationship. The model tested the demographic characteristic, convenience, prior internet knowledge, security perceived risk, Information on online banking. The results indicate that use of IB is influenced most strongly by convenience perceived risk, security and prior internet knowledge

Reference [54] in their study to measure service quality of internet banking in Saudi Arabia, they develop a list comprising 64 variables that influence service quality perception. A focus group interview was then conducted. The three factorial groups were named in accordance with the appropriate criteria: "efficiency and security", "fulfilment" and "responsiveness". The results of the factor analysis in terms of factor name reveals that "efficiency and security" is the most influencing factor in users' evaluation of service quality. Security, which involves protecting users from the risk of fraud and financial loss.

Reference [21] in their study adopts a quantitative approach to measure Chinese users' risk perception. The research classifies the risk of using IB to eight risk dimensions performance, security, financial, privacy, time, psychological, social and physical, 504 questionnaires distributed were fully completed. Security, performance, privacy and financial risks are considered the most important in delaying Chinese users' IBS adoption. The results show that security is perceived as the most important dimensions.

In addition, reference [44] examined the perceptual differences between IB adopters and non-adopters. The results indicated that adopters perceived internet banking use as less risky, more user-friendly and more useful compared to non-adopters who do not intend to use the

service. In UK reference [53] indicate that IB security is still a major factor in user' reluctance to adopt internet banking.

In the same vein, several studies found that perceived risk negatively affects perceived usefulness (PU) of using Internet banking [11,30,55]. Reference [55] investigate the perceptions, attitudes and behaviour of the youth market for internet banking services (IBS). A survey was carried out to acquire data from 164 respondents. The respondents were competent computer users. Three additional in-depth interviews were subsequently carried out. The results indicate that young people (age 16-29) have more positive attitudes and behavioural intentions towards using IBS than other user-groups. Moreover, the study suggests that customers who have higher levels of perceived risk about using IBS perceive IBS to be less useful. Moreover, reference [31] pointed out that the importance of security risk concerns is due to its significant negative effects on perceived usefulness. Based on the previous results the following hypothesis is proposed:

H3: Security risk has a significant negative impact on the perceived usefulness

2.2.2. Privacy Risk

Privacy refers to the protection of data that are collected either with or without the knowledge of the users throughout their communication with the Internet banking system [55]. Reference [21] clarified that the privacy risk is the risk of losing personal control. Users are concerned that their personal information may be manipulated or misused without their knowledge. Further, reference [46] studied users adoption of e-banking services in Malaysia in the light of ten determinants derived from extant literature, namely convenience, accessibility, feature availability, bank management and image, security, privacy, design, content, speed, and fees and charges. The survey results indicate privacy and security are the major sources of dissatisfaction. Results also reveal that privacy; security and convenience factors play an important role in determining the users' acceptance of e-banking services with respect to different segmentation of age group, education level and income level.

Reference [48] pointed out that if the bank users' belief that the banks protect their personal information, detect fraud and transactions are secure, they are more likely to accept IB systems

In addition, perceived worries of revealing personal information may produce adverse feelings that could negatively affect users perceived usefulness of using IB [11,21,56]. Accordingly the following hypothesis is proposed:

H4: Privacy risk has a significant negative impact on the perceived usefulness

2.2.3. Financial Risk

Reference [31] pointed out that many users have concerns of losing money while performing transactions or transferring money over the Internet. Similarly, reference [30] argued that the potential for monetary loss due to transaction error or bank account misuse is considered a financial risk. Reference [21] indicated that there is a positive relationship between privacy concerns and financial risk lead to conclude that the more users worry about losing their private data, the more they are

concerned about financial loss. Moreover, reference [11] indicated that privacy risk negatively affect users' perceived usefulness of using IB therefore, the same could apply for financial risk and the following hypothesis is proposed:

H5: Financial risk has a significant negative impact on the perceived usefulness

2.3. Behavioral Determinants and Perceived Ease of Use

Users can perceive ease of using IB if it is user-friendly, easy to operate and need less effort. The easier to use the technology the more likely to be accepted [11,47]. This IB services give users greater freedom in completing transactions, paying bills and performing other banking affairs [45]. If IB services is found to be very difficult, the user is more likely to use the traditional ways. Several factors proved to have an effect on perceived ease of use. These include- but not limited to –IB awareness, computer self-efficacy, and resistance to change.

2.3.1. Internet Banking Awareness

Reference [23] pointed out that awareness of IB services is important through effective use of flyers, brochures, web pages. If bank users have enough information about IB services and they perceive IB sites user friendly and easy to access, they might adopt such systems [48].

Several Studies have acknowledged that adoption of IB are determined by the level of awareness that a user has about internet banking and its possible benefits [5,14,23,40,41,45]. Reference [8] study adopt TAM and different variables to test IB acceptance in Saudi Arabia for a sample of 400 users. The variables were quality of the Internet connection, awareness, users' trust, social influence, resistance to change, self-efficacy age, gender, education, and income. The results revealed that awareness of online banking and its benefits have significant effects on perceived ease of use and perceived usefulness.

Although the importance of awareness on IB adoption none of the Egyptian studies addressed this variable therefore this research overcome this gap and propose the following hypothesis

H6: Awareness has a significant positive impact on perceived ease of use

2.3.2. Computer Self-efficacy (CSE)

Reference [27] defined "CSE as the own ability of individual to rely on his/her cumulative experience and learning from earlier use of a variety of technologies to use the service with no or minimal assistance". The assistance can be in the form of a manual, a phone call or a user representative. In the study [38] that investigates the effect of three factors namely computer self-efficacy, security issues, and website features on the TAM. The proposed modified TAM model has been tested using survey of a sample of 461 users in the United Arab Emirates. The data has been analyzed using Structural Equation Modeling (SEM) to evaluate the strength of the hypothesized relationships. The results strongly support the extended TAM model in predicating customers' attitude towards online banking. It also support the

significant effect of computer self-efficacy on customers' attitude through perceived ease of use and perceived usefulness. Moreover, in study [5] twenty-seven interviews were undertaken with strategic, tactical and operational managers at each of nine major banks; five in Oman and four in Australia. The factors chosen were perceived relative advantage, perceived organizational performance, perceived customer/organizational relationship and perceived ease of use provided. The results indicate that with experience in using computers and the Internet Australian banks found more the services easy to use, easy to navigate and quite accessible. However, Oman banks with lacking the experience in Internet issues were seen as inhibiting factor to use the IB.

Reference [55] indicated that users with higher self-efficacy are more willing to learn a new technology. Moreover, reference [10] indicated that CSE ability would lead to more favorable behavioral intention through its influence on perceived ease of use. The positive effects of CSE on perceived ease of use of new technology were found consistently in the literature [8,37,50,56]. These cumulative results indicated that CSE may minimize the negative effects of low ease of use and modify users' attitudes toward their intention to continue using IB services. Although the significance of CSE on perceived ease of use none of the Egyptian studies incorporate this variable therefore this research overcome this gap thus, the following hypothesis is proposed

H7: Computer self-efficacy has a significant positive impact on perceived ease of use.

2.3.3. Resistance to Change

Reference [8] addressed the issue of users' resistance to change and argued that users may favor using traditional ways of doing banking transaction and refuse to change. Reference [23] suggested that reducing personal relationships and face-to-face conversation in IB are seen as potential barriers to the adoption of internet banking.

Reference [28] conduct a survey among the retail banking users in Finland who had not adopted internet banking namely postponers, opponents and rejectors. Significant differences were identified between the groups explored. The resistance of the rejectors is much more severe and diverse than that of the opponents, while the postponers show only slight resistance. The results suggest that in this non-adopter group psychological barriers are the higher factor of resistance. The findings revealed that user desire to visit the bank branch and chat with the teller reduce the motivation to adopt IB services.

Likewise, reference [29] designed a typology of user resistance to innovations in four resistance segments, namely non-resistors, functional resistors, psychological resistors and dual resistors. The results indicated that not all users may perceive IB services as added value and they prefer familiar ways of transaction. Moreover, some users may perceive the technology to be too difficult to use, so they directly have negative image of the service related to the technology. Resistance to change from traditional ways of operating to new technologies such as IB, has an effect on attitude and is viewed through low perceived ease of use. However, only one Egyptian study [16] include in their study a variable namely the need of interaction (face to face). This research addressed resistance to change form two main arguments resistance

due to preference of traditional ways (face to face) of transaction and due to fear of using technology. Thus the following hypothesis is proposed

H8: Resistance to change has a significant negative impact on perceived ease of use.

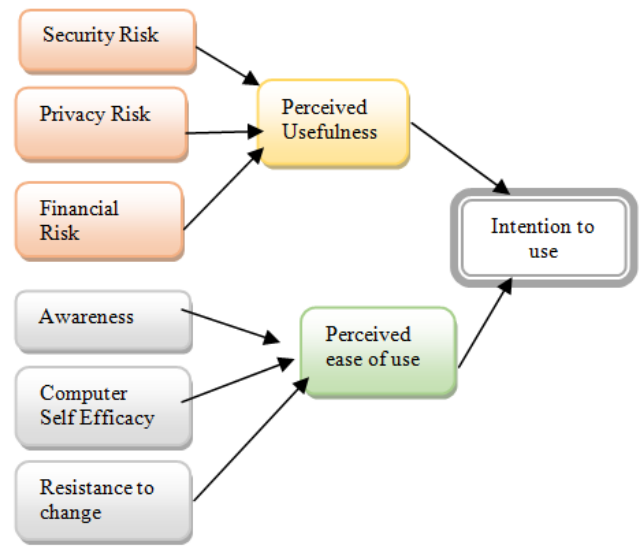


Figure 1. The proposed research theoretical model

3. Methodology

Testing the hypotheses proposed in the previous model involved developing and administering a questionnaire to a convenience sample of bank users in Egypt, assessing the reliability of the scales employed, and a Structured Equation Modeling (SEM) and statistical package Analysis Moment of Structures (AMOS Version 22) are used.

3.1. Sample

A reliable sample frame representing all bank users in Egypt, is not easily obtainable and cost-effective to be done in this research. Therefore, questionnaires are distributed in Cairo, the largest city in Egypt, the country's capital, have the highest population and considered the main area for all public and private banks. Therefore, Cairo's bank users could be considered a satisfactory representation of bank users in Egypt.

A total of 245 bank customers were recruited from several private banks working in Cairo-Egypt, out of which 223 agreed to participate in the study. After removing 23 incomplete questionnaires we had a usable sample of 200 questionnaires yielding a reasonably high response rate of about 81.6 percent. Based on the recommendations of [18] that the sample size should be 15-20 observations per variable. Therefore the sample size is consistent with this recommendation.

Participants were approached when entering the bank and were asked to fill the questionnaire. Before distributing the questionnaire, all participants were assured that their participation was voluntary and anonymity was guaranteed. The age of participants ranged between 18 to 50 years; the majority of participants (50.5%) were in the age range 30-40 years, about quarter of participants (25.5%) were in the age range 40-50 years,

18% of participants were in the age range (18-30 years) and the rest of participants (6%) were above 50 years. Compared with females' customers, males were the majority in the sample (60.5%). These characteristics indicate a reasonable mix of demographic groups represented in the data.

3.2. Measures

The questionnaire used in this research consisted of three sections: first, a description of internet banking and the IB services provided by banks. The second part of the questionnaire contain demographic information from each

respondent about his/ her gender and age. Third nine-part questionnaire were used to assess the research (factors) variables were adapted the measures from previous literature, which have been developed and validated empirically. Table 1 show the variables used and their sources.

All items were measured on a five-point Likert scale. Answers ranged from 1 (strongly disagree) to 5 (strongly agree). In addition, demographic variables including gender and age were also assessed. The descriptive statistics and reliability coefficients of these scales are shown in Table 2.

Table 1. The research variables used and their sources

Variable	Items	Source
1. Intention to use internet banking	4 items	Kumar Sharma and Madhumohan Govindaluri (2014)
2. Perceived ease of use	3items	(Davis, 1989)
3. Perceived usefulness	5 items	Khalil, Nor, Sutanonpaiboon, and Hamimah Mastor (2010)
4. Security	3 items	Harridge-March, Lifen Zhao, Hanmer-Lloyd, Ward, and Goode (2008)
5. Privacy	3 items	Harridge-March et al. (2008)
6. Financial risk	3 items	Harridge-March et al. (2008)
7. Awareness	3 items	AL-Majali and Nik Kamariah Nik Mat (2011)
8. Self-efficacy	4 items	(Wang, Wang, Lin, and Tang (2003)
9. Resistance to change	3 items	P. Laukkanen, Sinkkonen, and Laukkanen (2008) T. Laukkanen, Sinkkonen, and Laukkanen (2009)

Table 2. Descriptive statistics and reliability coefficients

Variable	Mean	Standard Deviation	Cronbach's Alpha
Intention to use	17.61	2.75	.864
Awareness	11.15	2.83	.745
Resistance to change	11.25	3.08	.746
Computer self-efficacy	15.21	3.42	.775
Perceived ease of use	9.54	3.72	.745
Security risk	10.63	3.93	.798
Privacy risk	10.86	4.63	.908
Financial risk	13.19	2.26	.763
Perceived usefulness	20.38	3.94	.815

The reliability measures, in terms of Cronbach's alpha, were above the recommended level of 0.70 as an indicator for adequate internal consistency [19].

4. Data Analysis and Results

To investigate the relationships between intention to use internet banking and different possible explanatory

variables, Pearson correlation coefficients were calculated as shown in Table 3.

It can be shown from the previous results that all different explanatory variables are significantly correlated with the outcome variable (intention to use internet banking). Moreover, the direction of the correlation coefficients was in the hypothesized way.

To test the theoretical model a structured equation modeling (SEM) and the statistical package Analysis Moment of Structures (AMOS Version 22) are used.

Table 3. Correlation matrix for variables

Variable	1	2	3	4	5	6	7	8	9
1.Intention to use	1								
2. Awareness	.433**	1							
3. Computer self-efficacy	.399**	.718**	1						
4. Resistance to change	-.526**	-.659**	-.598**	1					
5. Perceived ease of use	.326**	.713**	.729**	-.673**	1				
6. Security risk	-.429**	-.456**	-.499**	.687**	-.601**	1			
7. Privacy risk	-.495**	-.317**	-.313**	.607**	-.392**	.810**	1		
8. Financial risk	-.398**	-.331**	-.323**	.532**	-.632**	.574**	.653**	1	
9. Percieved Usefulness	.403**	.609**	.588**	-.673**	.640**	-.622**	-.583**	-.648**	1

SEM models show the relationships among variables using one or more regression equation. A collection of such equations is referred to as a structural equation model

The coefficients describing how dependent variables depend on independent variables are called path coefficients [27].

Table 4. Path estimates, standard errors and t-values for the hypothetical model

Path	Estimate	SE	t-value	Hypothesis Supported?
Security risk→perceived usefulness	-0.38	0.085	4.48**	H3(Yes)
Privacy risk→perceived usefulness	-0.388	0.078	4.97**	H4(Yes)
Financial risk→perceived usefulness	-0.76	0.114	6.642**	H5(Yes)
A warwness→perceived ease of use	0.325	0.086	3.77**	H6(Yes)
CSE→perceived ease of use	0.403	0.067	6.01**	H7(Yes)
RTC→perceived ease of use	-0.365	0.069	5.31**	H8(Yes)
Perceived usefulness→intention use	0.229	0.048	4.77**	H1(Yes)
Perceived ease of use→intention use	0.285	0.051	5.71**	H2(Yes)

Table 4 presents the path estimates, standard errors and t-values for the hypothetical model. All paths are significant. The table show that perceived usefulness and percieved EOU have a positive and significant effect on intention to use. However, percieved EOU has slight higher impact than perceived usefulness. Moreover, it shows that financial risk ($\beta = -0.760$, $SE = 0.085$, $t\text{-value} = 4.97$) has the highest negative significant impact among all the risk factors on user's perceived usefulness. This

results indicate that if financial risk increase by one this will lead to decrease in the perceived usefulness by 0.760.

Furthermore, the finding revealed that computer self-efficacy ($\beta = 0.403$, $SE = 0.069$, $t\text{-value} = 5.31$) has the highest significant impact on the perceived EOU and indicate that if CSE increase by one this will increase the perceived EOU by 0.403. Moreover, the structural model provides a reasonable and accepted goodness of fit indices as shown on Table 5

Table 5. Goodness -of- fit indices

Goodness -of- fit indices	Research Model Results
Goodness of fit (GFI)	0.97
Adjusted goodness of fit (AGFI)	0.96
Normed fit index (NFI)	0.94
Comparative fit index (CFI)	0.94
Root mean square error of approximation (RMSEA)	0.065

Table 5 show goodness of fit indices consistent with the recommended values in the literature GFI, AGFI, NFI, and CFI with 1 indicating maximum fit. In addition RMSEA with values 0.08 indicating good fit [20] Therefore, the results provide empirical support for the proposed research model in Figure (1). All the casual relationships between the variables in the research are supported. The correlation matrix along with the structural model support all the research hypotheses.

5. Discussion

The findings of this research strongly support and emphasize that TAM is a powerful model to understand the intention of users to accept IB services. The research results are consistent with similar studies conducted [6,7,8,26,27,50] that show TAM is a robust model which may be used as a predictive model and that perceived usefulness and perceived ease of use, have a positive impact on the intention to use internet banking. This finding support the fact that users may adopt Internet banking for the benefits and easiness in use in comparison to other traditional banking channels

Risk is a more comprehensive construct and the relationships among risk dimensions are complex. This research only considers financial, security and privacy risks which were proven, consistently, to be significant predictors of IB adoption [21,44]. The results revealed these risk dimensions to have statistically significant negative impact on perceived usefulness. This finding suggests users who have financial, security and privacy risks concerns about using IB perceive it to be less useful. This results are supported by previous studies that the highlight the importance of security risk and its significant negative effects on perceived usefulness. [30,31,55]. Moreover, the results indicate that financial risk have

more impact than other risk factors as users are concerned more about financial loss and fraud.

The findings indicated that if bank users perceive IB as user friendly, clear and understandable the acceptance of it can be increased. This improvement can be done by focusing on awareness, computer self-efficacy and minimizing the reluctance to use IB.

The awareness of online banking and its benefits has a significant effect on perceived ease of use this results in line with different studies that acknowledged that adoption of internet banking are determined by the level of awareness a user has about internet banking and its likely benefits [8,14,27,45,48].

In addition the results revealed the important role of self-efficacy as determinant of perceived ease of use which is consistent with previous researches [10,37,55,56]. The research findings indicate negative significant impact of resistance to change on perceived ease of use This results support the argument raised by reference [28] when there is a desire for face-to-face contact and the users do not want to change from currently familiar ways of transacting they perceive the IB to be too difficult to use.

6. Conclusion and Implications

The success of IB is determined not only by banks or government support but also by users' acceptance of it. The latter has a great influence on the adoption of internet banking. Good perception on using the Internet banking services could enhance the expansion in the banking industry. Egypt, in particular, has a great potential to benefit from the e-banking services; especially due to its high population expansion in the banking industry.

Therefore, this research aims at examining perceived risk and behavioral determinants of using internet banking in Egypt.

This research model is based on using the original beliefs of Technology acceptance Model (TAM) perceived usefulness and perceived ease of use and introducing new variables (such as ;security risk, financial risk, privacy risk, awareness, Computer self-efficacy (CSE) and resistance to change (RTC))which

The empirical findings of the research supported the theoretical model. All different explanatory variables are significantly correlated with the outcome variable (intention to use internet banking). Moreover, the direction of the correlation coefficients was in the hypothesized way.

Overall, the results indicate that the theoretical model provide good understanding of the variables that impact the intention to use IB. This could be interpreted in the light of two main points the sample size and the selection of the variables that proven its significance and impact on IB among researches done in developed countries and developing countries.

The research contribute to literature by emphasizing on the factors that improve or reduce internet banking usage in Egypt. Moreover, this research could contribute to bank' managers by providing several guidelines to encourage and promote IB. First: Enhancing awareness by informing users about the features and benefits of internet banking through different marketing and advertising strategies reference [53] suggest an idea that banks can launch brand communities through different social media platforms where they can post detailed information about internet banking or customers who are satisfied with internet banking can share their positive experiences with other less experienced users. Second for improving users ease of use provide a simple internet banking interface, user-friendly; information in Arabic and English languages. Keep users informed with the information on how to handle the problems if they occur; and to use internet banking services safely.

Third enhancing CSE banks need to provide training sessions for users and bank' employee to build good users service support. Fourth build a comprehensive and effective privacy protection laws to assure user confidence

Fifth: to decrease security, privacy and financial risks banks have and build secure firewalls to avoid hacker attack, developing methods for strengthening encryption, and authenticating websites. Work with online security firms to support and handle any security problems. Inform users in a simple and clear information how their privacy information are protected. In conclusion, Egyptian Bank' managers could invest in the factors that improve internet banking usage and reduce the factors that negatively impact in order to compete and expend their services.

Similar to any academic research, this research is subject to some limitations, first: the sample size is not large enough to generalize results therefore future research could expand the survey to include other cities in Egypt using random sample. Second: this research is a cross-sectional it is suggested for future research a longitudinal research to observe the impact of changes. Third this research measure the intention to use IB thus future research could measure the actual IB usage. Moreover, the wide spread of smart phones recommend a future research to examine user's intention to use Mobile banking.

Although the culture factor was included indirectly through resistance to change it is important to address this

such factor more clearly and in depth with comparison with different countries' culture.

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