ABSTRACT

The accelerate growth of e-commerce and advanced Internet technology have changed the way banking services are designed and delivered. Electronic commerce has meant that currently most banking products and services are conducted through the Internet. However, most of the previous works about e-commerce banking have focused mainly on developed countries, and less so on other developing countries. The underlying assumption is that most e-commerce users are from Western countries and they have a more favorable Internet environment. Thus, this paper aims to help address some of gaps in the current body of literature, specifically in our local context, through proposing an empirical model that can predict and indentify the factors that have the most influence on the customer’s intention to use e-commerce banking, and simultaneously assess the extent to which this technology is actually applied in Egypt as an example of developing country. This paper attempted to integrate and encompass the most frequently cited factors in the e-commerce literature, and applied them in the local context in order to best examine the phenomenon under investigation. Thus, the proposed model contained variables that have not been tested simultaneously in previous works.

Keywords: B2C e-commerce, e-commerce application, e-commerce banking, e-commerce transactions, Internet banking services, Internet technology

1. INTRODUCTION

The accelerate growth of Electronic commerce and advanced Internet technology have changed the way banking services are designed and delivered [4, 5, 21, 25, 35 and 41]. In this context, some authors pointed out that most industries have influenced in different ways by e-commerce, and that banking industry has been subject to this technological change, thus e-commerce has meant that currently most banking products and services are conducted through the Internet [e.g.31]. However, the empirical evidence from past research tends to support the view that e-commerce banking is becoming one of the most important delivery channels of banking services [2, 3, 7, 9, 10, 14, 16, 20, 21, 29, 30 and 40].

In contrast to previous works addressed e-commerce banking in developing countries [e.g. 25 and 41], the current study extended the research by combining the most critical factors identified in literature and developed a comprehensive model including these factors, which have never been integrated into one framework, to examination simultaneously for validation and relationship.

1.1 RESRACH PROBLEM

Despite the Internet has created new e-commerce markets, and having the potential to become the most powerful non-stone retailing channel in this century [3, 8, 21, 22 and 26] most of the previous works about e-commerce banking have focused mainly on developed countries, and less so on other developing countries, the underlying assumption is that most e-commerce users are from Western countries and they have a more favorable Internet environment [1, 17, 33 and 34]. In addition, our preliminary study revealed that the e-commerce banking remains largely unnoticed by a retail banking customers (B2C e-commerce customers) of Egypt.

These gaps in the research pose problems for developing countries because limitations in this area mean difficulties for their banks in planning and implementing e-commerce banking strategies [3]. Thus, this paper aims to help address some of these gaps in the current body of literature, specifically in our local context.

The term “e-commerce banking” is used to describe the case where banks’ customers conduct banking transactions on the internet [6, 33 and 35]. B2C e-commerce (or e-commerce retail banking) refers to the e-commerce transaction model in which business (banks) provide services to individual customers [37].

1.2 RESRACH OBJECTIVES

The principal objectives of the study are to: (1) empirically examines e-commerce banking application in the B2C e-commerce market of Egypt as an example of developing country, (2) determine the potential factors that have the most significant influence on this application in the Egyptian context, (3) develop a mathematical model that can predict the probability of e-commerce banking application.

This paper was structured as follows: This paper was structured as follows: We reviewed the literature and previous studies and followed the proposed models associated research hypotheses. Then our research methodology and data analysis were presented; from our findings, recommendations were suggested that may assist banks in developing strategies for maximizing the usage of e-commerce banking. Finally, managerial implications, study limitations and the potential for future research were provided.
2. LITERATURE REVIEW

An extensive review of the available bank marketing literature regarding e-commerce banking revealed some potential benefits that are associated with implementing e-commerce banking for both banks and clients, and identified particular factors that influence its users by B2C e-commerce customers. Here, the current study attempted to enlarge the scope of these factors to explicitly include two major groups: banking and non-banking constructs, based on the ability or inability of banks to facilitate usage of e-commerce banking, then constructs of each groups have been sub-classified to positive and negative factors. The potential benefits and constructs are discussed below, as cited in literature.

2.1 POTENTIAL BENEFITS OF E-COMMERCE BANKING

The potential benefits of e-commerce banking are well-recognized by many academics and practitioners, including bank and marketing managers [2, 11, 12, 39 and 40]. From the bank’s perspective, e-commerce banking allows banks to provide wide range of services (Internet banking services) through their websites with cost-effective than other customer-contact channels, with less staff and fewer physical branch requirements [2, 3 and 18].

In consistent with the above, Polasik and Wisniewski [28] indicated that the Internet can currently be considered as the cheapest distribution channel for standardized bank operations, such as account services or transfer of funds, and from the viewpoint of the consumers, the decision to use e-commerce banking is frequently motivated by convenience, as Online customers do not have to make a trip to the local branch, queue, or be constrained by the bank’s opening hours. Furthermore, many banks try to lure customers into using e-commerce banking by offering lower fees, or better rates on deposits and loans.

Turning to customers’ benefits e-commerce banking is perceived to provide faster, easier, and reliable service through a single platform when customers access a bank’s web site [20, 36 and 40]. Moreover, banking services can be delivered to customers online at any time and at any location in a customized personalized manner since e-commerce banking does not restrict customers to physical locations or geographic areas and does not depend on the operating hours of banks [3, 6, 8, 9, 13, 15 and 28].

2.2 BANKING FACTORS

Banking factors influence either positively or negatively the customers’ intention to use e-commerce banking and include items that are more or less under a bank’s control such as the perceived usefulness, perceived ease of use, perceived reliability as positive factors, and perceived security risk, perceived privacy risk as negative factors [22, 23, 24, 27, 31 and 34]. However, it is reasonable to assume that banking factors significantly vary in their relative importance, and differ from one context to another [16, 26 and 29].

For example, the empirical evidence from a survey by Litter and Melanthiou [23] highlighted that the respondents tended to disagree with the view that the Internet is a secure place for banking services, and the risk associated with possible losses from the online banking transaction is greater than in traditional environments.

2.3 NON-BANKING FACTORS

These constructs are not under the control of the bank. Non-banking factors have been described in previous studies as the educational level, income, position and familiarity with Internet [11, 24 and 32].

For example, Yiu et al. [40] found that respondents with a Bachelors degree or higher had a much higher usage rate than respondents with less education. Respondents with higher incomes also had much higher usage rates than those with lower income. In addition, the high income respondents were usually customers who required more sophisticated banking services in general. Thus, examination of the non-banking factors should enable Egyptian banks to focus on their market groups more effectively.

3. THE RESEARCH MODEL AND HYPOTHESES

In accordance with all of the arguments above, and based on an intensive review discussed earlier, as well as the feedback arising out of a series of preliminary in-depth interviews, a research model was developed in Figure 1.
The structural paths of the model from $P_1$ to $P_5$ represent the hypothesized relationships between the banking factors and the customers’ intention to use e-commerce banking, while the remaining paths from $P_6$ to $P_9$ represent non-banking determinants. The model advanced the following hypotheses to be tested:

Figure 1: The research model and its structural paths

H$_1$: Customers’ intention to use e-commerce banking is positively influenced by certain banking factors such as:
- H$_{1a}$: Perceived usefulness (P1)
- H$_{1b}$: Perceived ease of use (P2)
- H$_{1c}$: Perceived security risk (P4)
- H$_{1d}$: Perceived privacy risk (P5)
- H$_{1e}$: B2C e-commerce banking application in Egypt is considered high (P10)

Accordingly, the following multiple regression equation (EQ1) can be used:

$$\text{CIB} = a + b_{\text{POS}} \text{PUS} + b_{\text{PES}} \text{PES} + b_{\text{PRL}} \text{PRL} + b_{\text{PSR}} \text{PSR} + b_{\text{PPR}} \text{PPR} + b_{\text{EDU}} \text{EDU} + b_{\text{INC}} \text{INC} + b_{\text{POS}} \text{POS} + b_{\text{PAM}} \text{FAM}$$

4. RESEARCH METHODOLOGY

The methodological approach used in the empirical study is a combination of quantitative and qualitative methods. The research process involved the following major stages:

4.1 PRELIMINARY QUALITATIVE STUDY

In this stage, a series of in-depth interviews were carried out with Egyptian bank managers. The issues arising from this stage, combined with the literature findings, were used as a basis for the next quantitative study.

4.2 QUANTITATIVE STUDY

The quantitative stage in the form of questionnaire survey was conducted to collect data from retail banking customers of banks operating in Alexandria city, Egypt. This included the customers of public and private sector banks, joint venture and branches of foreign banks in Egypt. Simple random sampling was carried out in order to gain as many representative samples as possible.

4.3 VALIDITY AND INSTRUMENT

Before conducting the main survey, a pre-test was performed to validate the instrument. The pre-test involved ten respondents who were selected experts in Internet banking. Respondents were asked to comment on listed items that corresponded to the constructs, including the wording of the scales, the length of the instrument, the format of the questionnaires, and other comments on how the questionnaire could be improved. Therefore the instrument has confirmed content validity. The instrument included two parts. Part one was designed for collecting information about non-banking factors, thus some nominal scales were used. Part two was developed based on the constructs of banking factors, and questions in this part were evaluated on a seven-point Likert scale ranging from 1: strongly disagree to 7: strongly agree.

4.4 RESEARCH DESIGN

The research design for this study involved a cross-sectional survey that was conducted from September to November 2009. The questionnaire was originally developed in English, and subsequently translated into Arabic. The questionnaires were internally distributed through banking services officers who contacted respondents through personal interviews during work hours and introduced the purpose of the survey to them before delivering the questionnaires. Banks were promised a concluded report on the results of the research as an incentive for their cooperation. Among a total of 400 questionnaires that were delivered, 221 valid responses were received and used in data analysis, achieving a 53.00 percent usable response rate for the overall survey.

5. DATA ANALYSIS AND TESTING

5.1 ANALYSIS METHODS, REALIABILITY AND MULTICOLLINEARITY

Three data analysis methods were employed in this study: Multiple regression analysis with its associated statistical inference tests (F test and test on b), correlation and descriptive analysis. The values of the alpha coefficients exhibited an acceptable degree of reliability (all values ranged from 0.79 to 0.87). The total correlation matrix of the model was reviewed in-depth, and the results showed that there was no evidence of multicollinearity. The results of testing each of the three hypotheses are given below:

5.2 THE RESULTS OF TESTING HYPOTHESES H$_1$ AND H$_2$

Hypotheses H$_1$ and H$_2$ were accepted based on the data analysis. The results shown in Table 1, and the significant testing findings presented in Table 2 supported this acceptance: A strong highly significant association is found between customers’ intention to use e-commerce banking and both banking factors and non-banking factors (Multiple $R= 0.918114531 \text{ and } F=125.82076 \text{ at } p < 0.0001$ level). The coefficient of multiple determination indicated that these predictor factors explained the major proportion (91.8%) of the variability observed ($R^2 = 0.842934292$). The explanatory power of the research model is considered high and quite capable of explaining the variance of customer’s intention to use e-commerce banking (adjusted $R^2 = 0.836234807$).
noted that B2C e-commerce bank customers still worry about the security issues regarding the electronic transaction, banking, and simultaneously became the first positive factor. Using the value of the regression coefficients, shown in the previous table, the customer’s intention to use e-commerce banking can be predicted, in this study, by the following predictive equation (EG2):

\[ CIB = 1.73 + 0.06 PUS + 0.16 PES + 0.15 PRL - 0.17 PSR - 0.01 PPR + 0.24 EDU + 0.03 INC + 0.07 POS + 0.03 FAM \]

5.2 THE RESULTS OF TESTING

HYPOTHESIS H3

The descriptive analysis outputs in Table 3 showed a very low level of using e-commerce banking (\(X^* = 1.574660633\), \(S^* = 0.732424677\) and Skewness = 0.859229384), a small percentage of customers (14.48%) are regular e-commerce banking users, while a large proportion is considered either non-users (57.01%) or irregular users (28.51%). As such, our results don’t support hypothesis H3. Thus, it seems logical to state that this phenomenon occurs when B2C e-commerce bank customers feel that the Internet, as a delivery channel, is not secure, particularly if they have a low level of education.

Table 2: Variables included in the research model equation

<table>
<thead>
<tr>
<th>Factor</th>
<th>Regression Coefficients</th>
<th>Beta Coefficients</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUS</td>
<td>( b_{PUS} ) 0.05556</td>
<td>( b_{PUS} ) 0.087</td>
<td>3.04612</td>
</tr>
<tr>
<td>PES</td>
<td>( b_{PES} ) 0.15755</td>
<td>( b_{PES} ) 0.190</td>
<td>3.02063</td>
</tr>
<tr>
<td>PRL</td>
<td>( b_{PRL} ) 0.15529</td>
<td>( b_{PRL} ) 0.179</td>
<td>2.52625</td>
</tr>
<tr>
<td>PSR</td>
<td>( b_{PSR} ) -0.1662</td>
<td>( b_{PSR} ) 0.537</td>
<td>-1.1879</td>
</tr>
<tr>
<td>PPR</td>
<td>( b_{PPR} ) -0.0116</td>
<td>( b_{PPR} ) 0.034</td>
<td>-0.5596</td>
</tr>
<tr>
<td>EDU</td>
<td>( b_{EDU} ) 0.23979</td>
<td>( b_{EDU} ) 0.529</td>
<td>7.12431</td>
</tr>
<tr>
<td>INC</td>
<td>( b_{INC} ) 0.02724</td>
<td>( b_{INC} ) 0.035</td>
<td>0.30523</td>
</tr>
<tr>
<td>POS</td>
<td>( b_{POS} ) 0.07179</td>
<td>( b_{POS} ) 0.146</td>
<td>2.56617</td>
</tr>
<tr>
<td>FAM</td>
<td>( b_{FAM} ) 0.03043</td>
<td>( b_{FAM} ) 0.41</td>
<td>0.30078</td>
</tr>
</tbody>
</table>

Intercept a 1.73360 df n-k-1 211

Table 2: Variables included in the research model equation

On the other hand, education level (EDU) has also a significant impact (\( B_{EDU} = 0.529, p < 0.01 \)), as it can be noted that EDU is the second most important factor influencing customer’s intention to use e-commerce banking, and simultaneously became the first positive factor. The graphical presentation in Figure 2 clearly illustrates the findings discussed above; the values of the spider diagram strongly tend toward the left side, reflecting the low rate of E-commerce banking usage in the Egyptian market.

![Figure 2: e-commerce banking application in Egypt](image-url)
6. CONCLUSION
As stated previously, the main objective of this study was to contribute to the literature and to help address some gaps in the current body of literature, through developing a proposed empirical model that can predict and indentify the factors that have the most influence on the customer’s intention to use e-commerce banking, and simultaneously assess the extent to which Internet banking services are actually used in B2C e-commerce market of Egypt as an example of developing country.

The empirical results of this study provided support for the research model and its hypothesized relationships, showed that the research model has a high explanatory power and confirmed its robustness in predicting the customer’s intention to use such services. Several implications both for practitioners and academics can be drawn from this study.

In term of managerial implications, the growing importance of e-commerce banking and its potential positive and negative aspects have been highlighted throughout the study, after reviewing up-to-date relevant literature and examining over 40 previous works. These findings are particularly important for bank managers in formatting marketing strategies aimed to increase e-commerce banking usage in future and develop different communication strategies to overcome some consumer’s perceived barriers for using e-commerce banking services such as perceived security risk. In this regard, bank marketers may use face-to-face contact to have a great personal influence on their e-commerce banking nonuser customers, and focus on high educated customer more effectively.

From academician perspective, the results of the present paper might be seen as useful potential theoretical contributions to the specialized literature concerning this issue. Our research attempted to integrate and encompass the most frequently cited factors in the e-commerce literature, and applied them in the local context in order to best examine the phenomenon under investigation.

Thus, the proposed model contained variables that have not been tested simultaneously in previous works.

7. LIMITATIONS AND FUTURE RESEARCH
As any other research, the current study has some limitations and care should be taken when interpreting its results. The study was conducted in Egypt and therefore the findings may be specific to the culture in this developing country. Also, it should be noted that the research scope was focused on the retail banking (B2C e-commerce) industry. Since the study is cross-sectional in design, a further examination of our argument using a more in-depth longitudinal study is recommended in the future.

Finally, we must point out that although the majority of the hypothesized relationships were validated, and significant, the levels of coefficient of determination, multiple R-square ($R^2$) obtained, indicated that there are other variables that may influence our finding.

Consequently, it is necessary to develop more complex models which may introduce alternative variables; such models might open future research lines. Nevertheless, future researches could further examine the current proposed model in other countries with different cultures, and make comparisons, to see whether it can be applied, or expanding the present study to other business segments to infer more about the industry-wise differences.

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