

**AN EMPIRICAL INVESTIGATION INTO THE FACTORS
AFFECTING USAGE OF ONLINE BANKING
A STRUCTURAL EQUATION MODELING APPROACH**

Mahmud Rahman

University of Asia Pacific, Dhaka, Bangladesh

impeccable_9104@yahoo.com

Nahid Ferdousi

University of Asia Pacific, Dhaka, Bangladesh

ferdousi_nahid@yahoo.com

Nazreen Chowdhury 

University of Asia Pacific, Dhaka, Bangladesh

chowdhury.nazreen@gmail.com

Mahbubul Haque

University of Asia Pacific, Dhaka, Bangladesh

mahbubhasin@gmail.com

Abstract

Online banking in Bangladesh is a relatively recent phenomenon. The objective of this study is to figure out the impact of three influencing factors, namely, core services, security and trust, and awareness of service on the usage of online banking by the consumers. For this purpose, a sample size of 112 respondents living in the urban part of the capital city and using internet banking is considered. Structural equation modeling is employed to test the hypotheses developed for this study. The model suggests that while there is a high statistical significance of the effects of security and trust and awareness of service on the usage of online banking, the effect of core services is insignificant. The implications for the managers of the service providers and a few suggestions for future research are put forward in this regard.

Keywords: Online Banking, SEM, Internet Technology, Banking Industry, Bangladesh

INTRODUCTION

For the last two decades there has been a significant change in the pattern of banking services due to the rapid expansion and adoption of internet technology by the banks across the globe including both in developed and least developed countries (Roy et al., 2011). With innovation in banking ideas, online technology now provides very sophisticated services such as EFT (Electronic Fund Transfer), ATM (Automated Teller Machine), Credit cards, POS (Point of Sales), e-cash and so on without which we cannot imagine our today's banking world (Liao et al., 1999). Generally, banking is an information based industry where internet plays a significant role to maintain a secured and sound flow of information to customers as well as to bankers. Establishment of Security First Network Bank in 1995 in USA has made us to think that a bank is not only able to operate in the virtual world but also can simultaneously render all the conventional banking services to its customers (Grandy, 1995). Besides, conducting online banking services helps banks reduce their operating costs significantly by eliminating physical existence of branches. This is borne by the study Talmor (1995) that adoption of telephone banking in U.S. banks helps them reduce their banking cost by 60 %, which, according to the author, is one of the principal driving forces for banking industry to accept internet technology as an effective means of delivering their services. This is in concurrence with Halperin (2001) that online technology plays an instrumental role in achieving higher revenue and making customers more at home in doing banking activities.

While, there is no universally accepted definition of internet banking, it can broadly be defined as the provision of rendering banking services where customers are not required to wait in queues and can be served with all the facilities of modern and traditional banking system. The definition of online banking has gone through number of modifications as the internet becomes more pervasive in dealing with banking transactions. According to Daniel (1999) and Burr (1996), electronic banking is a way of providing customer with information through computer service, television, telephone or mobile phone service. Customer can instantly transfer fund, check the amount of their deposit history, withdraw cash, pay utility bills, maintain investment portfolio and can be disbursed with the funds as agreed upon with banks (Nasri, 2011).

Online Banking in Bangladesh

According to World Bank (2013), there are around 380 depositors per 1000 population in Bangladesh in 2011. Here, depositors include persons who have savings, current, time deposits and loan account in a bank. In another report Bangladesh Bank (2011) revealed ratio between depositors to people stands at 330 per 1000 population in the year 2010. In case of internet users, this ratio is 63 to 1000 (World Bank, 2013). Installation of fiber optic cable in 2006 has

unfolded a new horizon in expanding internet based banking system in Bangladesh. Total number of internet users in the country increased from 186,000 in 2006 to 5.5 million in 2012 according to a study conducted by International Telecommunication Union. In 2010 Bangladesh Bank (BB) introduced electronic system which provides a platform for all the scheduled banks under Bangladesh Bank to conduct inter-bank clearing activity in an accurate and faster way which was not possible under traditional system.

As the access to internet is becoming easier day by day in Bangladesh, online services by banks are now growing faster than ever. Moreover, strong banking base coupled with online technology can help a country to integrate with the world economy very effectively and in this regard Bangladesh has become a prime example among all least developed countries. Ali (2010) said that Bangladeshi banking industry has grown tremendously in respect of providing services especially in the area of online banking. This initiative by BB encouraged number of commercial banks to adopt online banking system in the country. Increasingly it is becoming clear that banks in this country are putting significant emphasis on internet based banking (Huda et al., 2004). Today we see that every scheduled bank in Bangladesh has online portal to cater the needs of their customers. Among privately owned commercial banks Islami Bank Bangladesh Limited, Eastern Bank Limited, Shahjalal Islami Bank Limited and BRAC Bank Limited are the pioneers in adopting internet banking system in Bangladesh. In case of foreign banks Standard Chartered and HSBC are first to provide customers with such facilities (Zaman and Chowdhury, 2012).

Scope and Objective of the Study

This research is conducted with the aim of enhancing our understanding as to the factors that drive a traditional customer to be an online banking customer. As the users of internet are increasing, so are the customers of internet banking. Managers of various banks are now interested to know what induces a customer in choosing a bank with online services. Our research in this regard will provide valuable insight to understand the dynamics of behavior of internet users in Bangladesh. Specifically, the objective of the study is to ascertain the impact of the factors, namely, core services, security and trust, and awareness of services, on the customer usage of online banking in Bangladesh.

This paper has been organized in five different sections. In the first part we shed light on overall online banking sector of Bangladesh. We reviewed existing literature as to our chosen topic and to formulate hypotheses in our second section. Third, we described the methodology adopted in our study. Next, we presented the research findings and discussed their implications. Finally, we concluded our paper by highlighting the future area of conducting research.

LITERATURE REVIEW

With the advent of internet technology banking world has changed significantly the way it rendered services to its customers in earlier times. It is the financial system in general that has benefitted greatly from introduction of online system in its daily affairs (Kautish, 2008). Now banks are more intricately related with national economy owing to their greater role in performing activities in the arena of global trade and commerce (Mondal and Shah, 2013). Today banks can serve their customers from the remotest corner of the world without having any tangible form of existence and this has been possible due to the evolution of internet technology over the two decades (Bruene, 2002). Daniel (1999) argued that more and more banks in developing nations consider e-banking as their new avenue of doing business. Sathye (1999) revealed the determinants of adopting online banking service in Australia. In his research, he found that internet technology helped banks greatly to reduce their cost. So banks pursued their own customers to adopt internet technology. The study further said that internet technology helped banks to add greater value in services than traditional system. Talwar (1999) added that installation of online based software and automated fund clearing system helped banks and customers to eliminate many non value additive activities in their daily transactions.

Unnithan (2001) conducted an extensive research on customers both in India and Australia. His finding was that customers in Australia have a higher chance to adopt internet banking because of the country's literate young people who are well acquainted with online technology than India. Yakhlef (2001) claimed that customers can be served with diversified services in an online banking system. It also helped banks to retain current customers for a longer period as well as to acquire new customers at a lower cost which in turn help banks to generate higher revenue. Aki ((2002) showed that from the year 1993 to 2002 around 45 percent of total household families has online data connection with banks and almost 90 percent takes telephone services in their cell phones in Finland in their transactions with banks. He claimed that the principal reason for adopting internet technology is to increase satisfaction of clients. Howcroft and Durkin (2003) highlighted that adoption of internet based banking technology had a positive result in building a strong relationship with customers. They revealed that internet technology led to increased rivalry among banks. Their research also found that banks can increase their profit and average productivity if they can successfully blend technology with traditional channels of delivery.

Joseph and Stone (2003), in their research, analyzed that technology which is easier for customers to use for instance automatic cash withdrawal and telegraphic transfer actually helped banks to increase their market capitalization in terms of subscribers. They also stressed on the point that to create a loyal customer base a bank should be equipped with the technology

that can serve customers' need on a real-time basis. They concluded that banks should prepare a research report in regular interval whether customers are able to adapt with the latest online services provided by them. Lustik (2003) claimed in his research that transaction through internet helped Estonia to save cost almost 1% of its total GDP. Research has also been conducted in India on what factors are considered by the customers from quality perspective in connection with a bank (Sureshchander et al., 2003). Yu and Boon (2003) described in their research that how innovation in technological sector influenced banks in Malaysia. They concluded that management with strong technical support in information technology determines the degree of success a bank will have in providing customers online services.

Mantel (2000) built a model in his research that depicts what are the incentives for a customer to take online services for instance payment of bill via internet, borrowing through credit cards and using debit card for cash transactions. This study also highlighted that greater flexibility in communication and better control in performing daily business transactions influenced customers to switch from traditional banking to online banking. Gan et al. (2006) in their research claimed that degree of standard in service, potential risks, quality of academic education and job are the determining factors in choosing internet banking. According to Lichtenstein and Williamson (2006) easy accessibility to banking service through internet was the driving force for Australian customers to opt for online banking. In another research Nelubiri and Sinti (2006) argued that banks should delve into the perception and mindset of customers to develop a clear idea as to the level of acceptance of internet technology in conducting banking activities. A study by Robbins (2006) made an attempt to find out whether location has any impact on bank in adopting internet technology. Research by Walter (2006) concluded that user friendly interface, increase amount of perceived convenience and efficient customer handling are positively correlated to ensure large scale technology based internet services. Study by Joseph et al. (1999) indicated that complete accounts of all banking transactions, speedy response from customer service, and other electronic facilities such as kiosk are needed for aged and physically retarded persons. Another study by Bauer et al. (2005) tried to suggest that online domain of banks is built on three fundamental things and these were basic or principal services, complementary services and troubleshooting services. Gabriel et al. (2005) focused on determining the relationship between standard of banking services and its potential impact on client satisfaction in Brazil. They also suggested that in a rapidly changing technology world banks should diversify their services for customers to stop switching to other banks.

In Bangladesh, however, this arena as a research topic has yet to be paid adequate attention. Research was conducted on individual banks; for instance, Roy et al. (2011) tried to find out the influencing factors that made customers of Dutch Bangla Bank Limited, a leading

commercial bank in Bangladesh, to accept online services. They found that better security system, higher level of privacy, relative convenience in using internet and presentation of information in online portal led customers to choose internet banking. Researchers also suggested some key variables that provide customers better online services. Mondal and Saha (2013) made an attempt to find out the variables determining customer satisfaction on nine private commercial banks. According to this study, customers are satisfied with services such as electronic bill payment and fund disbursement through online. They also revealed that limited access to internet and lack of sufficient amount of electricity have been the major impediments for Bangladeshi customers to switch to internet based banking in the country. Farhana and Chowdhury (2012) conducted a study on 37 commercial banks in Bangladesh as to the availability of technology based banking services in the country. They found that a very handful of indigenous private commercial banks are able to provide technology based services in a limited scale. Two overseas banks in the country, namely, Standard Chartered and HSBC are the pioneers in introducing online banking services such as point of sales, banking from any branch, kiosk and online letter of credit opening. Major services provided by homegrown commercial banks are ATM booth, any branch banking, debit cards and banking through SMS from mobile phones (Farhana and Chowdhury 2012).

Development of Research Hypotheses

In this study, three exogenous variables considered are: core services, security and trust, and awareness of service, while the endogenous variable is the usage of online banking. The three hypotheses developed for this study has been discussed below:

Core Services on the Usage of Online Banking

Core services refer to a firm-specific ability to cope with the changing time in the competitive market. Such ability encompasses efficient mobilization of resources, recognizing the market opportunity, determining the strategic plan and creating comparative advantage. According to Ankit (2011), core services of banks are assembled by the expertise of the employees, number of employees in each branch, quality services, the convenient time schedule of banks as well as customers' preferred and updated statements, thereby catering to the needs of the customers and brand image of the bank. Through the internet media, all banks can perform efficiently by delivering the latest up-to-date information to customers' (Corrocher, 2002). E-banking benefits the banks in enhancing the customers' satisfaction and loyalty (Nath et al, 2001). Internet banking enables the customers not to visit their banks frequently which can save their time and transaction cost and can increase their loyalty to banks by providing various financial services

offered through website. The updated websites with wide range of financial offerings increase the customers' dependency on banks which in turn also augments the profits of banks. The service quality (e.g. perceived usefulness, reliability, etc.) persuade consumers to use online banking (Liao and Cheung, 2008). Online banking provides easier operation systems and several beneficial services for which the customers do not expend any effort (Davis, et al., 1989; Al-Somali, et al., 2008). The appropriate core services offered by banks attract the customers to continue to use the internet banking (Sun, Heshan and Ping Zhang, 2006) that can influence their performance and brand image (Teece et al. 1997).

In the competitive banking industry, all banks should fulfill the business as well as the emotional and psychological needs to customers to enhance the usage of internet banking in Bangladesh. According to Ibrahim et al. (2006), several core services such as electronic service quality, convenient and accurate electronic banking operations, proper queue management, the accessibility and reliability of services, service personalization, the friendly and responsive customer services should be provided to the customers to increase the usage of online banking. In the competitive market, a bank can differentiate itself from competitors by assuring high quality services. The updated product information on the website and layout affect the customer satisfaction as well as the usage of online banking (Doll, Raghunathan, Lim and Gupta, 1995; Kumar, 2009; Parasuraman, 1998; Naeem and Saif, 2009). It can, therefore, be hypothesized as:

H1: Core services have positive impact on the usage of online banking by customers.

Security & Trust on the Usage of Online Banking

Studies reveal that security and trust are an important determinant for the consumers in adopting online banking. Security refers to the protection of customer's private information and their money from being hacked by others and the provision of a technical assurance that customers are legally confined. This is echoed by Rayport and Jaworski (2004), that 'security is the ability of a system to prevent illegal or inappropriate use of its data and to deter cyber-criminals and hackers'. This is also shared by Pavlou (2001) that security is defined as 'the subjective probability with which consumers believe that their private information will not be viewed, stored and manipulated during transit and storage by inappropriate parties in a manner consistent with their confident expectations'. According to Howcorft et.al (2002), security is the foremost attribute that determine online banking adoption; they further opine that customers remain worried about security before using online banking. Dixit found that security and privacy stand as prime concerns to the acceptance of online banking. According to Akinici et al (2004),

choice of online banking service is accomplished by security. Lu et al., (2006) mentioned that using of online banking would become ineffective without enough security.

As far as trust is concerned, it can be defined as general belief that banks and organizations provide customers security for transaction through website. It refers to the feelings of enthusiasm to rely that customers are protected from online theft. It is a set of beliefs combined with integrity, benevolence and competence (Doney and Canon, 1997; Gefen and Silver, 1999; Lin and Wang, 2006). Gan et al. (2006) advocate that if modern banks want to generate profit, they must provide online banking; this is shared by Anderson and Narus (1990) who argue that trust has often been associated with the attainment of profitable and lasting relationships with the clients. According to Gerrard et al, (2006), email scams, identity theft and phishing generate a deficit of trust amongst the consumers that prejudice their perceptions. Vatanasombut et al. (2008), therefore, recommend that only trustworthiness can switch non users who are skeptical of the online service to become users of online banking. This is in line with other studies (Suh and Han, 2002; Kassim and Abdulla, 2006) that state that when the users share sensitive information through online banking, they mostly rely on trust, which is deemed as a precursor to dedication of online banking (Vatanasombut et al., 2008). It can thus be inferred as:

H2: Security and trust have significant effect on adopting online banking.

Awareness of Service on the Usage of Online Banking

Awareness of service is the proper understanding of services provided by online banking and knowing the pros and cons of using it. Widjana and Rachmat (2011) point out that awareness of service refers to customer's sufficient knowledge vis-à-vis the existence and benefits of online banking services as well as how to use it. As argued by Somali, et al. (2008), the amount of information available to customers is one of the determinants of the level of awareness of service. Williamson and Lichtenstein (2006) found that the reason for not adopting online banking on the part of the non-users could be attributed to their lack of awareness of services. As the level of awareness owned by the customers enhances, they will increasingly perceive the usefulness of internet banking service (Widjana and Rachmat, 2011). This, as suggested by Howard and Moore (1982), would greatly influence customers to use online banking. According to Sathe (1999), lack of awareness of service about online banking stands as one of the obstacles to use online banking among customers. Along this line, Fitzgerald (2004) argued that most of the non- users of online banking were unaware of services provided by online banking systems. It is, therefore, incumbent upon policy makers, as advocated by Woodall (2003), to create awareness about the benefit of technologies offered to individuals. This

concur with Dixit and Datta (2010), who found that banks in India should raise the level of awareness of service to attract adult customers who believe that online banking is not secured. Consistent with Mukti (2000) and Chung and Paynter (2002), it can be argued that awareness of service have positive influence on online customers to their usage of online banking. It is thus posited as:

H3: Awareness of service has significant effect on using online banking.

METHODOLOGY

In order to carry out this study, first, a survey questionnaire was developed. In so doing, few issues are considered, such as, services as offered by the banks, consumers' awareness and knowledge about online banking, their opinions relating to privacy and security of their personal information, and trust they repose on the banks, the frequency of their usage of online banking, etc. The instrumentation of the measurement items for the three exogenous variables, namely, core services, security and trust, awareness of service, and the one endogenous variable, i.e. usage of online banking on the part of the consumers was based on the extant literature (e.g. Shah ankit, 2011; Dixit, Dr. Soroj K. Datta, 2010; Kazi Omar Siddiqi, 2011; Sathye,1999; Venkatesh et al. ,2003; Wang et al. 2003). The questionnaire so developed was then subject to reviews for content validity by the academicians and practitioners well-versed in this regard. The final questionnaire was thus modified that contained 18 items, with each exogenous variable containing 4 items, and the endogenous one 6 items. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to obtain the opinions of the respondents regarding the measurement items of the variables.

Regarding the sample size as chosen for this study, it adheres to the suggestion that the number of respondents should be at least five times the total number of measurement items constituting the study variables (Hair et al. (2010). Since the total number of such items stands at 18, a total number of 100 respondents would be adequate. With this view in mind, 180 survey questionnaires were distributed to the target respondents living in Dhaka, the capital city of Bangladesh.

The reason of choosing this only urban metropolis can be attributed to the fact that the notion of online banking is still at a nascent state in Bangladesh; as such, people in the urban area are more likely to have gained a more informed understanding insofar as the adoption or the usage of online banking is concerned. The selection of respondents was done based on purposive sampling, whereby the participants of the survey had to meet some prescribed criteria, such as, (i) they had to have experience of using online banking for at least 6 months, (ii) they must have at least a bachelor degree as academic qualification.

Data input was done in SPSS version 15.0 to perform the descriptive analysis of the demographic attributes of the respondents and the reliability analysis of the study variables. Structural equation modeling was performed using AMOS 16.0 to test the hypotheses developed for this study.

ANALYSIS AND FINDINGS

Out of the total 180 questionnaires distributed, 112 questionnaires are returned that amounts to a response rate of 62%. Prior to conducting various analyses, data screening is done to address the few missing values in the survey questionnaires. This section presents the profile of the respondents, descriptive and reliability analysis of the study variables, and the full-fledged structural model done by AMOS version 16.0 that highlights the results of testing of the research hypotheses. The number of iteration taken by AMOS to achieve minimization is 9. The maximum likelihood technique is used for estimation.

Analysis of Demographic Variables

Table 1 portrays the respondents' profile that highlights their gender mix, age, income, occupation, academic qualifications, frequency of their weekly usage of online banking.

Table 1: Demographic profile of the Respondents

Demographic Variable	Frequency	Percentage
Gender		
Male	85	75.9
Female	27	24.1
Total	112	100.0
Age		
25 or less	10	8.9
26-35	83	74.1
36-45	16	14.3
46-60	3	2.7
Total	112	100.0
Monthly Income (Tk.)		
Less than 5000	3	2.7
5001 – 15000	3	2.7
15001 – 30000	23	20.5
30001 – 50000	35	31.3
50001 – 75000	30	26.8
75001 – 120000	15	13.4
Above 120000	3	2.7
Total	112	100.0

Academic Qualifications		
Bachelor	37	33.0
Masters	75	67.0
Total	112	100.0
Occupation		
Businessman	12	10.7
Student	9	8.0
Service holder	89	79.5
Others	2	1.8
Total	112	100.0
Frequency of usage per week		
More than 4 times	2	1.8
3 – 4	37	33.0
1 – 2	57	50.9
1 - 2 times per month	16	14.3
Total	112	100.0

As seen from Table I, out of 112 respondents, 85 are male and 27 are female. In terms of their age-group, an overwhelming majority of about 75% falls into 26 – 35 years of age bracket followed by about 15% and 9% in the brackets of 36 – 45 and below 25 years of age, respectively. Regarding their level of monthly income, about 32% of the respondents earn in the range of above 30,000 – 50,000 Tk.; this is followed by about 27% with monthly earnings of above 50,000 to 75,000 Tk. Besides, about 20% and 14% of the respondents make a monthly income of above 75,000 to 1,20,000 Tk. and from 15,000 to 30,000 Tk., respectively.

As far as respondents' academic qualifications are concerned, to third of them possess masters degrees, while the rest has bachelors. In terms of their occupation, about 80% belong to service holders followed by 12% of businessmen, 8% of students. When it comes to the frequency of their weekly usage, more than 50% of the respondents mention that they use it 1 to 2 times followed by one third of them with 3 to 4 times a week. Only about 2% uses online banking more than 4 times weekly.

Descriptive Statistics and Reliability Measures

In order to have a meaningful data interpretation, the descriptive statistics presenting the mean, standard deviation and the reliability measure of the four factors are provided in Table 2.

Table 2: Descriptive Statistics and Reliability Measures

Variables	Mean (Item)	SD (Item)	Cronbach alpha
Core Services (CS) (4 items)	3.793	0.5387	0.785
Security and Trust (ST) (4 items)	3.737	0.6547	0.794
Awareness of Service (AS) (4 items)	3.656	0.6020	0.783
Usage (6 items)	3.640	0.6290	0.811

From Table 2, it is observed that the means of responses of the items representing 'core services', 'security and trust', and 'awareness of service' stand at around 3.79, 3.74 and 3.66, respectively, each falling below 4.0, which corresponds to "agree" in the Likert scale. This suggests that there is room for improvement in various issues vis-à-vis these factors. As for the usage of online banking, the mean hovers around 3.6 implying that the consumers are yet to adopt it to a satisfactory level.

In this study, reliability is measured using Cronbach alpha as an indicator of internal consistency among the variable items with the cut-off value of 0.7 being appropriate for SEM. As the values of Cronbach Alpha in the above table indicate, all the scales exhibit adequate internal consistency, ranging from a minimum of 0.783 for awareness of service to a maximum of 0.811 for consumer usage of online banking services.

Confirmatory Factor Analysis

The structural equation modeling (SEM) consists of two processes: first, testing the measurement model and then the structural model. According to Kline (2010), the measurement model points to the suitability as measurement instrument of the observed indicators representing a latent variable. The adequacy of a measurement model is performed by confirmatory factor analysis (CFA). For this, three fit indices are checked to determine the fitting of the model with the data: normed chi-square, root mean square error approximation (RMSEA) and comparative fit index (CFI). The general guidelines of the cut-off values for such indices: Normed chi-square and RMSEA are to be less than 5 and 0.08, respectively, while CFI values are to be above 0.9 (Hair *et al.*, 2010). Table III presents the CFAs for the four factors or the constructs, i.e., Core services, security and trust, awareness of service and consumer usage of online banking. As the Table III suggests, all the four factors or the constructs have adequate construct validity with the cut-off points of all the three indices being adequately satisfied.

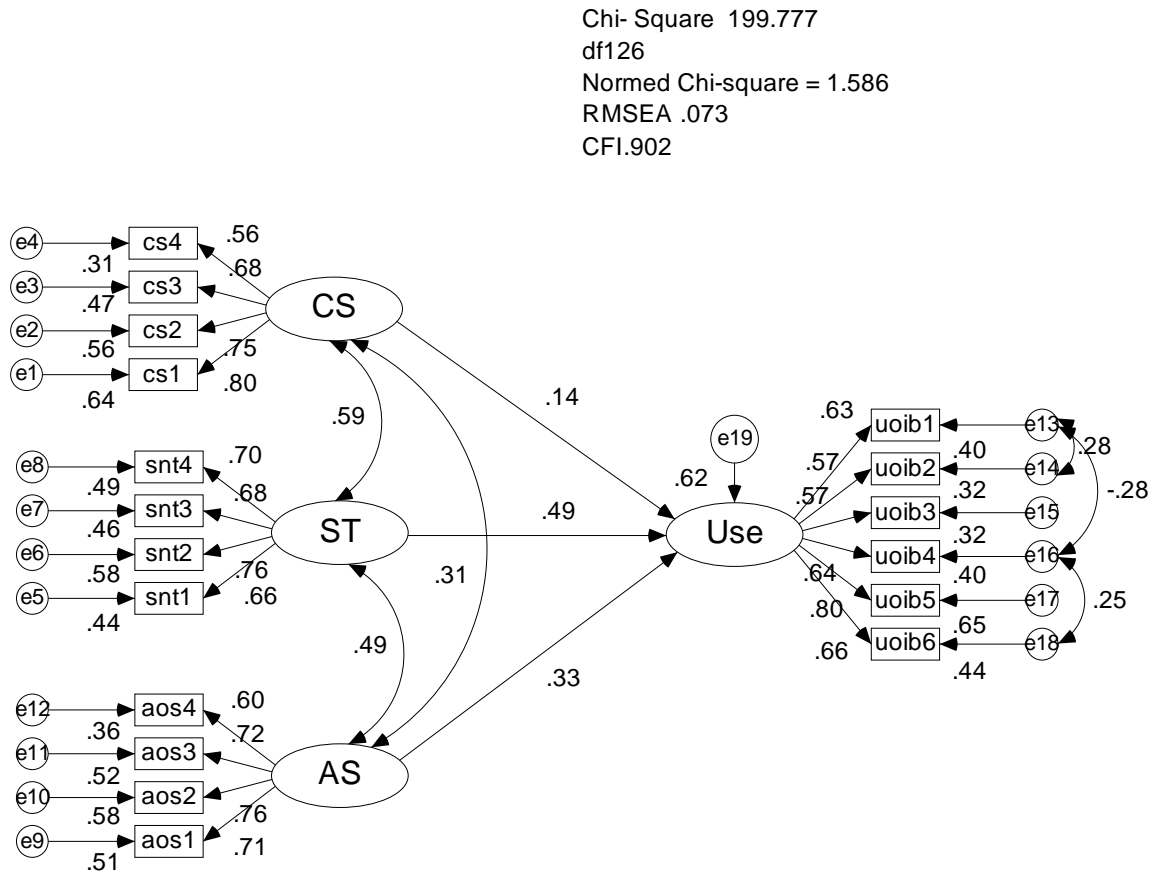
Table 3: Results of CFAs of the Four Factors

Goodness-of-fit statistics	Normed-Chi Square	RMSEA	CFI
Core Services (CS)	1.532	0.069	0.992
Security and Trust (ST)	0.016	0.000	1.000
Awareness of Service (AS)	0.248	0.000	1.000
Usage of Online Banking (Use)	1.671	0.078	0.981
Threshold values for the fit indices	< 5.0	< 0.08	> 0.90

Structural Equation Modeling

The structural equation modeling (SEM) is used to test the causal effect among the main constructs of a hypothesized model (Kline, 2010). Figure 1 shows the structural relationships among the four constructs or the factors undertaken in this research.

Figure 1: Full-fledged Structural Model



From Figure 1, it is observed that the structural model adequately fits with the sample data as all three fit indices meet their threshold values with normed- chi square and RMSEA falling well below 5.0 and 0.08 respectively, and CFI with a value of above 0.90. Besides, the constructs exhibit adequate convergent validity as all the loadings have values of above threshold point of 0.50. From Table IV and Figure 1, it is observed that two path co-efficients, namely, ST→Use and AS→Use prove to be statistically significant at $p < 0.001$, while the other one, i.e., CS→Use does not. It can, therefore, be inferred that in this study, the hypotheses H2 (Security and Trust have positive impact on the usage of online banking), [ST→Use] and H3 (Awareness of service have positive impact on the usage of online banking), [AS→Use] are supported. The

hypothesis, H1 (Core services have a positive impact on the usage of online banking), [CS→Use], is not supported by the model (Table 4).

The model in Figure 1 demonstrates that security and trust exerts a higher influence (0.49) than that (0.33) of awareness of service on the usage of online banking with core services having no statistically significant effect. The combined effect of these three account for 62% of the total variance in online banking usage by the consumers. From Figure 1 and Table IV, the model further provides evidence of statistically significant correlations among the influencing factors that stand at 59%, 49% and 31%, respectively.

Table 4: Regression Weights: (Group number 1 - Default model)

		Estimate	S.E.	C.R.	P	Result
Use <---	CS	.127	.111	1.144	.253	Not Supported
Use <---	ST	.460	.148	3.106	.002	Supported
Use <---	AS	.300	.108	2.775	.006	Supported

DISCUSSIONS AND IMPLICATIONS

Most of the respondents in our study are between 26 to 35 years which is around 74 % of total sample size. Drawing such a large sample from that age group is consistent with the population structure of Bangladesh, where large number of population belongs to age group of 20 to 40. Access to internet demands not only affordability but also computer literacy. Three middle income groups of our study represent 78.6% of total respondents. This explains the fact that a large number of people who are using internet banking have moderate level of income as they are early in their career and this also substantiates the findings of World Bank (2012) where it says that internet literacy is higher among young people of Bangladesh. And, the finding that respondents with masters are almost double than those with bachelors falls in line with the existing condition where masters degree as the academic qualification is considered an important prerequisite of almost every job recruitment in our country.

Our result is consistent with the prior studies (such as Dixit and Datta, 2010; Chung and Paynter, 2002; Sohail and Shanmugham, 2004; Gerrard and Cunningham, 2003a, 2006b; Sayar and Wolfe, 2007; Sohail and Shaikh, 2007), where they concluded that security and trust and awareness of service have positive effect on using online banking. Online banking provides a great deal of opportunity to its customers. But it also causes security issues, whereby some unscrupulous persons can encroach upon the clients' confidential information. Howcroft et al.'s (2002) study, claiming that consumers averse to use online banking services were concerned over security offered by banks. Also, security issues arise when customers misuse the system

without having a proper understanding of online banking system. In Bangladesh, online banking security can be focused in different perspectives: software/system security, information security, external security and so on. Sometimes banks lose control over the system due to expanded computer capabilities, geographical dispersal of access points, and the use of various communication paths, including public networks (Islam, 2005). In Bangladesh, the identification of an individual is not yet supported digitally like digital signature, digital certificate, etc; this poses a hindrance in executing the service with its full functionality. Despite the presence of online banking service in Bangladesh, its scope is largely underutilized, where lack of awareness stands out as one of the main causes besides, government policy, higher charges, lack of institutional support, etc.

In their study, Widjana and Rachmat (2011), however, concluded that awareness of service has no significant relationship with online banking users; this finding is thus at variance with that of the current study. On the other hand, Sathye (1999) found that in Australia, security concerns and lack of awareness of service are the barriers of using online banking among the customers. They found that compared to business users, individual customers had more security concerns and, at the same time, were even more unclear about the online banking services and benefits, thereby affecting the usage of online banking. Research done by Laforet and Li (2005) also indicated that awareness of services is the key difference factor between users and non users of online banking and respondents who were not aware of services provided by online banking did not use this service. In another study, Yee and Faziharudean (2010) find that if customers cannot trust online banking services, they would not use online banking. Banks should, therefore, build the trust amongst the customers about their security to spread online banking services.

CONCLUSION

The present study is aimed at finding out the impact of three influencing factors, namely core services, security and trust and awareness of service on the usage of online banking in Bangladesh. Structural equation modeling is employed to test the hypotheses developed for this study. The figures of mean values as presented in descriptive statistics stand at less than 4.00, implying that there is room for improvement regarding the various offerings as provided by the banking institutions as well as the extent of usage of online banking by the consumers. As is observed from the full-fledged structural model, all the factor loadings of the indicators representing the study variables cross the threshold value of 0.50, attesting to the presence of adequate convergent validity. The model indicates that while the two hypotheses, i.e., effects of (i) security and trust, and (ii) awareness of service on the use of internet banking, are supported

at $p < 0.01$, the other relating to the effect of core services is not. The study further reveals of a higher statistical significance of the impact of security and trust (49%) compared to that of awareness of service (33%) when it comes to the adoption of internet banking on the part of the users. Apart from this, the overall impact of all the three factors on the usage of online banking stands at 62.4%.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

No study is free from limitations; this one has also a few. These along with the suggestions for future research are presented below:

- As mentioned above, in this study, the impact of only three factors on the usage of online banking in Bangladesh is investigated. Further studies can look into other factors, such as, convenience and comfort, integrity of the service providers, etc. in this regard. Besides, dimensions concerning the technology acceptance model (TAM) that can also play a crucial role for adoption of internet banking by the consumers are worth mentioning for any potential research agenda.
- This study is a cross-sectional one. Any future study can thus employ longitudinal surveys among the users to better gauge their perceptions vis-à-vis online banking on different time periods. Besides, this can also delve deep into the gap between what the consumers expect and what they are offered by the service providers. Insofar as any theoretical concept is concerned, the application of SERVQUAL can surface as a prime candidate in this regard.
- The current study employs a sample size that takes into account only three exogenous variables, each comprising four pertinent measurement items. There is thus a scope of taking up a larger sample size covering the respondents from other metropolitan cities, particularly, Chittagong – the business hub in the south of Bangladesh where internet has permeated the daily lives of people living in those regions. The empirical evidence gleaned from such a study with a bigger sample size would be of immense value as far as the rigor and the generalizations of the research findings are concerned.
- Regarding the application of structural equation modeling in this study, the inclusion of mediating variables, such as quality of internet connection might provide a better picture as to the usage of internet banking in Bangladesh. The moderating effects of various demographic variables as to what extent they embrace the various features such as gender, income, professions, etc. of the respondents could also be discerned in any future research.

REFERENCES

- Acharya, Ram N, Kagan, A & Lingam, S 2008, 'Online banking applications and community bank performance', *International journal of Bank Marketing*, Vol. 26, No.6, pp.418-439.
- Ali, M. M. (2010). E-business and online banking in Bangladesh: An analysis. AIUB Business and Economics Working Paper Series,
- Anderson, J.C. and Narus, J.A. (1990), "A model of distribution firm and manufacturer firm working partnerships", *Journal of Marketing*, vol. 54, pp. 42-58.
- Aki, O.K. (2002), "Management of Technology in Banking", [http://www.iamot.org/conference /view paper/2002](http://www.iamot.org/conference_paper/2002). Accessed on 15/05/07
- Akıncı S., Aksoy, Ş., Atılğan, E. (2004), "Adoption of internet banking among sophisticated consumer segments in an advanced developing country", *International Journal of bank marketing*, 22(3): 212-32.
- Ankit, S 2011, ' Factors influencing online banking customer satisfaction and their importance in improving overall retention levels: An Indian banking perspective", *Information and knowledge management*, Vol.1, No.1, pp.45-55.
- Bauer, H.H.; Hammerchimat, M.; and Falk, T. (2005),"Measuring the Quality of Ebanking Portals", *International Journal of Bank Marketing*, Vol. 23 No. 2, pp.153175.
- Bruene J (2002), Online banking by the numbers. Available at: <http://www.onlinebankingreport.com> (Accessed on 17 April 2012)
- Burr, W. (1996). Wie informationstechnik die bank organisation verandern Konnte. *Bank and Markt*, 11, 28-31.
- Casalo,L.V., Flavian,C & Guinaliu,M, 2007, 'The role of security , privacy, usability and reputation in the development of online banking", *Online Information Review*, Vol.31,No. 5, pp. 583-603.
- Daniel, E. (1999). Provision of electronic banking in the UK and the Republic of Ireland. *International Journal of Bank Marketing*, 17(2).
- Demoulin , Nathalie T.M.& Djelassi, S 2013, 'Customer responses to waits for online banking service delivery", *International Journal of Retail &Distribution Management*, Vol. 41,No.6,pp.442-460.
- Dixit,N. and Datta,K.S. (2010). "Acceptance of E-banking among Adult Customers: An Empirical Investigation in India" . *Journal of Internet Banking and Commerce*, vol.15, no.2.
- Doney, P.M. and Cannon, J.P. (1997), "An examination of the nature of trust in the buyer-seller relationship", *Journal of Marketing*, vol. 61, pp. 35-51.
- Fitzergelad, K. (2004). An Investigation into People's Perceptions of Online Banking [online]Availablefrom:<http://staffweb.itsligo.ie/staff/eward/ebus%200203/Discussion%20topics/Online%20Banking.ht>Accessed 7 March 2010].
- Gabriel, C.; Bellini, P.; and Henrique, L. (2005), "Service Quality in Banks: Brazilian Experience", *Journal of Internet Banking and Commerce*,Vol.10 ,No. 3, December
- Gan, C.; Clemes, M.; Bunchai Limson, V.; and Weng, A. (2006), "A Logit Analysis of Electronic in New Zealand", *International Journal of Bank Marketing*,Vol. 21, No. 6, pp. 360383.
- Gefen, D. and Silver, M. (1999), 'Lessons Learned from the Successful Adoption of an ERP System', Proceedings of the Proceedings of the 5th International Conference of the Decision Sciences Institute. Athens, Greece, 1054-1057.
- Gerrard, P. and Cunningham, J.B. (2003). The Diffusion of internet banking among Singapore consumers. *The Journal of Bank Marketing*, 21 (1), 16-28.
- Gerrard, P., Cunningham, J.B. and Devlin, J.F. (2006). Why consumers are not using internet banking: a qualitative study. *Journal of Services Marketing*, 20 (3), 160-8.
- Grandy, T. (1995). Banking in E-space. *The Banker*, 145(December), 74-75.

- Gurau, C 2002, 'Online banking in transition economies: the implementation and development of online banking system in Romania', *International journal of Bank Marketing*, Vol.20, No.6, pp.285-296.
- Hair, J. F., Black, W. C., Babin, J. B. and Anderson, R. E. (2010), *Multivariate Data Analysis. (7th ed.)*, Upper Saddle River, Prentice Hall, New Jersey, NJ.
- Halperin, K. (2001). Balancing act. *Company Business and Marketing*, February.
- Howard, J. and Moore, W. (1982), "Changes in consumer behavior over the product life cycle" in Tushman and Moore (EDS), *Readings in the Management of Innovation*, Pitman, p.128
- Howcroft, J. B. & Durkin, M. (2003). Relationship marketing in the banking sector: impact of new technologies. *Marketing Intelligence and Planning*, 21(1), 61.
- Howcroft, B., Hamilton, R. & Hower, P. (2002). Consumer attitude and the usage and adoption of home-based banking in the United Kingdom. *The International Journal of Bank Marketing*, 20 (3), 111–121.
- Huda, S., Momen, M. A., Ahmed, M. (2004). Online banking system. *Finance and Banking*, 6(1 & 2).
- Joseph, M.; McClure, S.; and Beatriz, J. (1999), "Service Quality in Banking Sector: The Impact of Technology on Service Delivery", *International Journal of Bank Marketing*, Vol.17, No. 4, pp. 182-191.
- Joseph, M. and Stone, G. (2003), "An empirical evaluation of us bank customer perceptions of the impact of technology on service delivery in the banking sector", *International Journal of Retail and Distribution Management*, 31, 190-202.
- Kartik Chandra Mondal Anup Kumar Saha K 2013, Client Satisfaction of Internet Banking Services in Bangladesh: An Exploratory Study *ASA University Review*, Vol. 7 No. 1.
- Kautish, S. (2008), "Online Banking : A Paradigm Shift", *E-Business*, Vol. 8, No.10, pp. 5459.
- Kline, R. B. (2010). *Principles and Practice of Structural Equation Modeling* (3rd ed.). New York: Guilford Press.
- Kolsaker, A. and Payne, C. (2002), "Engendering trust in e-commerce: a study of gender-based concerns", *Marketing Intelligence and Planning*, Vol. 20 No. 4, pp. 206-14.
- Laforet, S. and Li, X. (2005), "Consumers' attitudes towards online and mobile banking in China", *International Journal of Bank Marketing*, vol. 23 no. 5.
- Lassar, W.M., Manolis, C & Lassar, S.S 2004, 'The relationship between consumer innovativeness, personal characteristics and online banking adoption', *International journal of Bank Marketing*, Vol.23, No.2, pp.176-199.
- Liao, Z., Shao, Y., & Chen, A. (1999). The adoption of virtual bank: An empirical survey. *International Journal of Information Management*, 19(1), 63-74.
- Liechtenstein, S.; and Williamson, K. (2006), "Understanding Consumer Adoption of Internet Banking: An Interruptive Study in the Australia Banking Context", *Journal of Electronic Commerce Research*, Vol.7, No. 2, pp. 5062.
- Lin, H. and Wang, Y. (2006), 'An Examination of the Determinants of Customer Loyalty in Mobile Commerce Contexts', *Information & Management*, 43(3), 271-282.
- Lustik, O. (2003), "Electronic Banking in Estonia", Paper Provided by Faculty of Economics and Business Administration, University of Tartu (Estonia), Vol.21.
- Mantel, B. (2000), "Why Don't Customers Use Ebanking Products: Towards a Theory of Obstacles, Incentives and Opportunities", FRB Chicago Working Paper No. EPS20001.
- Mukherjee, A & Nath, P 2003, 'A model of trust in online relationship banking', *International journal of Bank Marketing*, Vol.21, No.1, pp.5-15.
- Nasri, W. (2011). Factors influencing the adoption of internet banking in Tunisia. *International Journal of Business and Management*, 6(8), 143-160.

- Nelubiri, O.N.; and Sinti,Q. (2006), "Consumers Attitudes, Systems Characteristics and Internet Banking Adoption in Malaysia", *Management Research*, Vol. 29, No.1/2,pp.1627.
- Nupur, J.M. 2010, 'E-Banking and customers' satisfaction in Bangladesh: An analysis", *International review of business research papers*, Vol.6, No.4, pp. 145-156.
- Pavlou, P. (2001). Integrating trust in electronic commerce with the Technology Acceptance Model: Model Development and Validation. *Seventh Americas Conference on Information Systems*, 816-822.
- Pikkarainen,T., Pikkarainen, K., Karjaluoto, H. & Pahnla, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research*, 14(3), 224-235.
- Rayport J F and Jaworski B J (2004), "E-Commerce: Security Issues", *International Journal of Online Security*,Vol. 42, No. 1,pp. 41-57.
- Robbins, E. (2006) "Has Electronic Banking Affected the Performance of Bank Location?", Article Provided by Federal Reserve Bank of Kansas City in *Journal of Financial Industry Perspective*.
- Roy, K, Mihir, Sk.Kamrul Hassan K, Sk. & Bhuiyan, M, M 2011, 'Online Banking in Bangladesh An Empirical Analysis' *ASA University Review*, Vol. 5, No. 2, pp. 111-128.
- Sathye, M. (1999). Adoption of internet banking by Australian consumers: an empirical investigation. *International Journal of Bank Marketing*, 17(7), 324-334.
- Sayar, C. and Wolfe, S. (2007). Internet banking market performance: Turkey versus the UK. *International Journal of Bank Marketing*, 25 (3), 122-141.
- Shan Lu. C., Lai, K. H., Cheng. T. C. E (2006). Adoption of Internet Service in Linier Shipping: An Empirical Study of Shippers in Taiwan. *Transport Reviews*, Vol. 26, No. 2, pp 189 – 206.
- Sheshunoff, A 2000, 'Internet banking- an update from the frontlines", *ABA Banking journal*, Vol. 92, No.1, pp. 51-53
- Sureshchander, G.S.; and Rajendran, C.; and Anantharaman,R.N. (2003), "Customer Perception of Service Quality in the Banking Sector of a Developing Economy: A Critical Analysis", *International Journal of Bank Marketing*, Vol.21, No.5, pp.233242.
- Siddiqi, K.O. 2011,' Interrelations between service quality attributes, customer satisfaction and customer loyalty in retail banking sector in Bangladesh", *International Journal of Business and Management*, Vol.6, No.3, pp.12-36.
- Sohail, M, and Shanmugham, B. (2004). E-banking and Customers' preferences in Malaysia: an empirical investigation. *Information sciences, Informatics and Computer Science: an International journal*, 150 (3-4), 207-217.
- Talmor, S. (1995). New life for dinosaurs. *The Banker*, 145(September), 75-78.
- Unninthan (2001) described "the impact of e-banking adaptation on Australian and Indian banking sectors with the help of qualitative and quantitative analysis",*Journal of the Academy of Marketing Science*, April 2004 vol. 32 no. 2 144-158
- Waite, k & Harrison, T 2004, 'Online banking information: what we want and what we get, *Qualitative Market Research: An international Journal*, Vol.7, No.1, pp.67-79.
- Walter, H.R. (2006), "Why Consumers Use and Do Not Use Technology Enabled Services", *Journal of Service Marketing*, Vol. 20, No. 2, pp.125135.
- Widjana, A.W. and Rachmat,B. (2011), " Factors determining acceptance level of internet banking implementation", *Journal of Economics, Business and Accountancy Ventura*, volume 14, no. 2, pp 161 – 174.
- Yakhlef (2001) evaluated, "The services provided through internet and website", *Journal of Business & Industrial Marketing*, 23(1), pg no:59-69,2003.
- Yee,Y.B. and Faziharudean, M.T. (2010) , "Factors Affecting Customer Loyalty of Using Internet Banking in Malaysia", *Journal of Electronic Banking Systems*, vol. 2010, <http://www.ibimapublishing.com/journals/JEBS/jebs.html>

Yu , M.C. ; and Boon, H.O.(2003), "Success Factors in Echannels: The Malaysian Banking Scenario", *International Journal of Bank Marketing*, 21(7), 369 377.

Zaman, F. & Chowdhury, P. (2012). Technology driven banking in Bangladesh: Present status, future prospects and challenges. *BUP Journal*, 1(1), 56-78.