Automation and Financial Performance of Banks

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Abstract

Automated banking applications offer wide benefits to customers and banks and it is no longer a " good to have " but an " essential service for survival " in this era of globalization. Automation of banking services such as internet banking, ATM banking, telephone banking or mobile banking enable bank customers to access accounts and general information on bank products and services through a personal computer, mobile phones or other intelligent devices. The use of information technology in providing banking services is becoming increasingly important day-by-day because it reduces banks' operating costs, delivers fast and accurate records and improves banks' profitability. This research categorizes the banks operating in Bangladesh into three groups based on the extent to which they are offering automated services—fully automated, moderately automated, and not automated and investigates the impact of automation of banking services on improving financial performance of banks doing business in Bangladesh.

Key words: Banks, Financial Performance, Automation, Bangladesh

1. Introduction

In today's competitive world automation of banking sector has become a necessity for banks' survival in the market. Automation or e-banking not only helps the banks to provide timely and correct information but also helps banks to reduce their operationg costs. It also benefits the customers to get services 24 hours a day. Through e-banking, customers have access to information from their offices, home PC or any other places which increases customers' convenience and saves time. Therefore, banks that are fully automated are expected to gain a competitive edge over the other banks that are either moderately automated or not yet automated. Various studies have been conducted to examine the impact of automated banking

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services on the profitability of banks and found that there is a positive relationship between the quality of automated services and financial performance of banks (Malhotra and Singh, 2006; Ciciretti, Hasan and Zazzara, 2009). However, Al-Hawari and Ward (2006) and Al-Hawari (2005) found indirect relationship between the quality of automated services and bank profitability.

Compared to developed countries, in Bangladesh, automation of banking is in its infant stage and is a new step taken by the government in order to improve their banking sector. In 2010, Bangladesh Bank has introduced the automation of check processing system in order to save time, reduce operating costs, and improve profitability. However, to our best knowledge, there is little or no studies investigating the impact of automation on the profitability of Bangladeshi banks. On this background, this study is a modest attempt to assess the relationship between the extent of bank automation and financial performance of banks.

2. Automation in Bangladesh banking sector

At present, there are 47 banks operating in Bangladesh. Most of them are offering limited electronic banking services. The foreign commercial banks operating in Bangladesh namely, Standard Chartered Bank, Citi Corp. N.A., and HSBC are the pioneer to introduce e-banking in Bangladesh (Ali, 2010). They provide a wide range of e-banking facilities like ATM banking, internet banking, mobile banking, home banking, online banking etc. In term of offering automated services, the private commercial banks are ahead of state-owned banks. AB Bank, Bank Asia, Dutch Bangla Bank, Eastern Bank, Dhaka Bank, Prime Bank, Brac Bank, Mercantile Bank and Mutual Trust Bank have already stepped on towards automated banking facilities. Among the four nationalized commercial banks, Janata Bank Ltd. is offering some e-banking facilities. All of these commercial banks mainly offer ATM banking facilities. A very few banks offer internet banking and mobile banking facilities.

3. Literature Review

The idea of measuring the contribution of automation on financial performance of banks is new. Therefore, it was difficult to find a well-structured definition of bank automation. Since in Bangladesh, most banks provide basically three automated services—ATM banking, internet banking, and mobile banking, the authors of the present study are considering only these three dimensions of service channels as automated services and therefore, based on the degree to which these services are being offered by banks operating in Bangladesh, banks are categorized as- fully automated, moderately automated and not automated. We think the definition developed by Santos (2003) and Al-Hawari (2005) can be used for our paper because it does not only cover the basic dimensions of electronic services but extends its view beyond internet

-based dimensions. Automated banking service quality is defined by these researchers as the customer's overall assessment of the excellence of services delivered through electronic networks such as the internet, ATM and telephone banking (Santos, 2003). These three electronic delivery channels are identified as the core automated delivery channels by many other scholars (Joseph and Stone, 2003; Joseph, McClure, and Joseph, 1999; Radecki, Wenninger, and Orlow, 1997). Interestingly, no direct relationship has been found between automated service quality dimensions and financial performance of banks (Al-Hawari and Ward, 2006; Al-Hawari, 2005). Al-Hawari (2005) revealed that customer retention can play a mediating role through which automated service quality dimensions—ATM banking, telephone banking and internet banking will have strong impact on bank's profitability. They found that without this mediator the financial performances of banks are not affected by automation. Similar results were observed by Al-Hawari and Ward (2006). They found that although there is no direct association between automation of banks and profitability of banks, but when customer satisfaction acts as a mediator, this automated service quality dimensions—ATM banking, internet banking, and telephone banking could impacts bank's profitability. Contrary to these researches, a study by Ciciretti, *et.al.* (2009) found strong relationships between the banks that have adopted the new internet technology in offering banking services in Italy and their profitability. Adoption of internet banking was found to have a strong significant association with bank's financial performance (Ciciretti *et. al.* 2009).

Inspired by the studies on automation of banking sector in the developed countries, the authors of the present study have decided to conduct a similar research on automation in Bangladesh banking sector to see if there is any relationship between the degree to which a bank is automated and its financial performance. In this study, we have taken three elements as automated service quality dimensions—ATM, internet banking, and mobile banking. All these three categories of banks have been considered as independent variables. Bank financial performance is considered as dependent variable in this paper. Therefore, the conceptual model is shown in Fig. 1.

Fig 1: Conceptual Framework

4. Methodology and Data

We have collected information for all (forty) scheduled commercial banks operating in Bangladesh and divided all banks into three categories based on their degree of automation. Banks are graded on three criteria of automation, viz.; ATM Banking, Internet Banking, Mobile Banking and assigned 1 point for fulfilling each of these criteria and zero for vice versa (see Table 1). Fully automated banks (a score of 3 out of 3), moderately automated banks (a score of either 1 or 2 out of 3), and not automated (a score of zero out of 3). A bank that is offering services through all these three dimensions is given a score of three and is considered as a fully automated bank. A bank that is offering services through one (or two) of these three automated service quality dimensions is given a score of one (or two) and is considered as a moderately automated bank. A bank that is not offering services through any of these three automated service quality dimensions is given a score of zero and is named not automated bank.

Table 1: Criteria for assigning scores

Automation Criteria	Score
ATM Banking	1
Internet Banking	1
Mobile Banking	1
Total	3

In the next step, these three categories of banks were related with their financial performance data. In this paper the objective based performance measures such as, return on assets (ROA), return on equity (ROE), earnings per share (EPS) and price to earnings ratio (P/E Ratio) were used to assess financial performance of banks. In order to take into account the issue of time lag, the bank automation status of 2008 and the financial ratios of 2009 have been collected to observe the impact of the degree of bank automation on profitability of these banks.

5. Results

5.1 Degree of Automation

Classification of banks according to the three levels of automation shows that, 16 banks are fully automated, 18 banks are moderately automated and 5 banks are not automated (see Table 2). Thus it can be commented that the banks in Bangladesh are rapidly moving towards automation of their services, though some of the state owned banks are lagging behind in the race.

Table 2: Classification of banks according to the level of automation

Degree of Automation	No. of Banks
Fully automated	16
Moderately automated	18
Not automated	5

Note: Score of 3 indicates full automation (FA), score of 1-2 indicates moderate automation (MA), and score of 0 indicates not automated (NA).

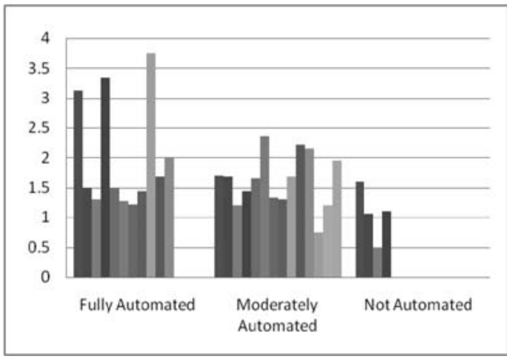

Fig 2: Percentage of ROA

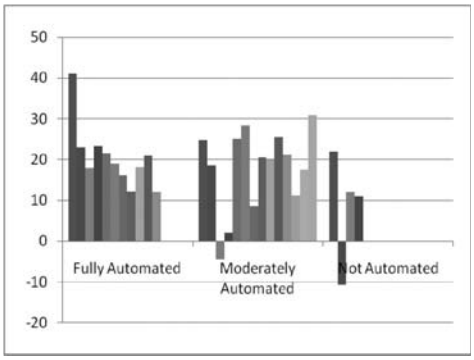

Fig 3: Percentage of ROE

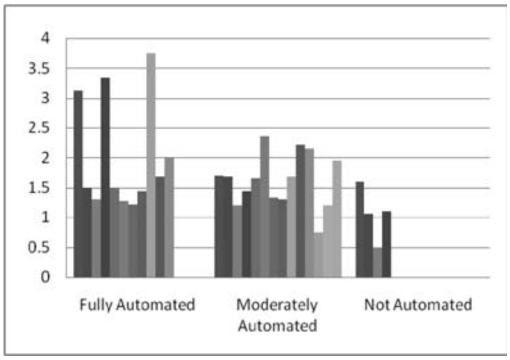

Fig 4: EPS in Bangladesh Taka(BDT)

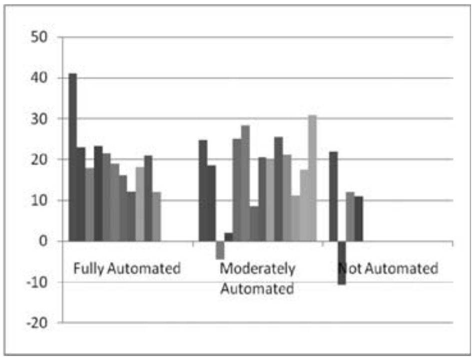

Fig 5: P/E Ratio

5.2 Automation and Performance

Banks are plotted against their performance measures by classifying into three levels of automation, viz., fully automated, moderately automated and not automated (see Figs. 2-5). A few banks were omitted for having extreme values and insufficiency of data and finally 29 banks were included in the analysis. From the figures we can see that, except in return on assets (ROA), there is no visible difference or trend in other performance indicators such as, return on equity (ROE), earnings per share (EPS) and price to earnings ratio (P/E Ratio).

Table 3: Automation and Profitability (ROA)

	Fully Automated	Moderately Automated	Not Automated
Sample Size (valid N)	11	14	4
Mean	2.00	1.62	1.05
Variance	0.86	0.20	0.30
F-test		2.52	
P—value		0.09	

Decision: Reject the null hypothesis

Table 4: Automation and Profitability (ROE)

	Fully Automated	Moderately Automated	Not Automated
Sample Size (valid N)	11	14	4
Mean	20.51	17.86	7.76
Variance	60.55	103.31	280.29
F-test		1.91	
P—value		0.16	

Decision: Do not reject the null hypothesis

Table 5: Automation and Profitability (EPS)

	Fully Automated	Moderately Automated	Not Automated
Sample Size (valid N)	11	14	4
Mean	38.74	33.12	41.81
Variance	418.31	351.88	615.61
F-test		0.37	
P—value		0.69	

Decision: Do not reject the null hypothesis

Table 6: Automation and Marketability (P/E Ratio)

	Fully Automated	Moderately Automated	Not Automated
Sample Size (valid N)	11	14	4
Mean	15.73	19.73	25.43
Variance	15.85	76.05	28.01
F-test		1.82	
P—value		0.18	

Decision: Do not reject the null hypothesis

5.3 F Test

The parametric *F-test* (H_o: $\mu 1 = \mu 2 = \mu 3$) has been tested to prove that the hypothesis of equality of all the mean returns against the alternative are not true. We have found difference in mean values among banks having different level of automation in case of ROA and ROE(see Table 3 and 4). However, *F-test* results support this observation only in case of ROA (see Table 3). In case of other performance measures such as EPS and P/E ratio, like ROE, the difference in mean values among the three categories of banks could not be proved statistically (see Table 5 and 6).

6. Summary and Conclusion

We have conducted a benchmark study to test the relationship between bank automation and financial performance. The results of the study lead us to the following observations:

1. Among the banks investigated we have found sixteen banks to be fully automated and another eighteen to be moderately automated as on 2008. Recent regulatory move by Bangladesh Bank (the central bank of Bangladesh) to expedite the process must have increased the level of automation. Thus it can be concluded that the banking sector of Bangladesh has made significant progress towards providing better banking services by the thorough technologies.
2. If we consider the fundamental profitability based performance measures such as ROA, we can find difference between banks based on their level of automation. However market based performance measures such as P/E ratio does not support this difference. This might indicate that, Bangladeshi banks having higher level of automation have distinguished their performance on fundamental profitability ratios, but are yet to translate this into market performance.
3. The degree of automation grading conducted by this study might be used as a benchmark to monitor the level of automation in the banking sector in Bangladesh.

However, this study has several limitations. The sample has been confined to scheduled commercial banks operating in Bangladesh. Also the number of banks have been reduced further due to non-availability of data for some banks. Thus the results of the study can not be replicated for the entire banking sector of Bangladesh. A more comprehensive study both by increasing the sample size and by employing other analytical means might be conducted to have a wider view. This area leaves the scope for further studies.

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