Impact of Electronic Banking on Operational Performance of Commercial Banks in Sri Lanka

Prabodhi, W. A. D[1] and Buddhika, H.J.R.[2]

Abstract

Introduction- Information and Communication Technology (ICT) is essential for financial markets for faced and sustain the competition. However, a limited number of studies have been conducted in Sri Lanka to determine the impact of e-banking on banks' profitability in Sri Lanka. This study critically investigated the effect of e-banking on operational performance in Sri Lanka.

Design/Methodology/Approach- The secondary data gathered during the year 2014 to 2019 concerning fee and commission income on internet banking, number of branches, number of ATMs, from the published annual reports of ten selected banks systematically. Regression analysis processed to determine the effects of electronic banking on profitability. The descriptive statistics, Pearson correlation were used for the data analysis through E-Views 11 statistical software.

Findings – Based on the results, the fixed-effect model found a significant positive relationship among IB (Internet Banking) on ROA, negative significant with ROA and BN (Branch Netwok), ATMs. Also, the insignificant relationship between ROE and IB. CIT (Cost to Income ration) and IB have negative significant, and other variables are a significant relationship with CIT.

Conclusion: Results proved that; e-banking has significantly contributed to the banks' operational performance in Sri Lanka.

Key Words: *E-baking, branch network, operational performance, profitability, Efficient*

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1Department of Finance, Faculty of Commerce and Management Studies, University of Kelaniya *(Prabodhidilsha@gmail.com)*
2 Department of Finance, Faculty of Commerce and Management Studies, University of Kelaniya

1. Introduction

Over the last few decades, the banking industry has experienced a dramatic change resulting from ICT adoption. Financial institutions, including banks, have moved from traditional paper and manual operations to electronic operations such as electronic banking (Salehi & Alipour, 2010). However, the latest techniques of E-banking are said to provide effective services and reduce operating cost. Implementing E-banking involves substantial risk and a cost regarding how banks should integrate E-banking with existing service successfully. This study investigates how the expansion of e-banking affects the profitability and efficiency of the bank by analysing the data of companies under the banking sector in the Colombo Stock Exchange in Sri Lanka.

1.1. Need for and importance of the study

The study gives a better understanding of how electronic banking facilitates efficiency through electronic payment processing and reduced cost of operations (Jayasiri et al., 2016a).

The study gives a better knowledge of the issues under investigation and sharpened research skills and fills the previous studies' gaps.

It explains how E-banking can give them a better way to access capital due to its short payment processing period and increased efficiency in payment and accounting processes.

1.2. Problem Statement

Electronic banking has a strong impact on overall performance of banking, because it improves efficiency and effectiveness of the banks (Olorunsegun, 2010). According to (Sumra et al., 2011), e-banking increases the cost to the customers since it includes the bank charges commissions and service charges for e-banking. The banks in Nigeria has decreased the adoption for e-banking due to high cost of ICT (Oyewole et al., 2013). Furthermore, e-banking creates a high cost associated with software research & development, amortization of purchase software, data processing, promotional expenses, and employee training (Sullivan, 2000).

The banks with e-banking facilities can outperform their counterparts in profitability (Malhotra & Singh, 2009). E-banking is gradually creating a cashless society (Aduda & Kingoo, 2012). E-banking has a strong impact on overall performance of banking, because it improves efficiency and effectiveness of the banks (Olorunsegun, 2010). And only a limited number of studies have been conducted in the Sri Lankan context to identify the impact of e-banking on banks' profitability in Sri Lanka. Lack of evidence about the Sri Lankan context and the lack of consensus of the findings in internationally available literature puzzles the bankers and policy makers on the impact of e-banking on the operational performance of Sri Lankan banks. Therefore, this study sought to fill the gap assessing the impact of E-banking on commercial bank operations, also, to outline the bottlenecks confronting commercial banks in utilizing E-banking in Sri Lanka.

1.3. Research Questions

I. R01- Identify the relationship between E-banking and facility and the efficiency of commercial banks in Sri Lanka?
II. R02- Identify the relationship between E-banking and profitability of a commercial bank in Sri Lanka?

1.4. Objectives of the Study

I. To determine the impact of electronic banking on the operational performance of commercial banks in Sri Lanka.
II. To determine the relationship between E-banking and the Efficiency of commercial banks in Sri Lanka.
III. To determine the relationship between E-banking and the Profitability of commercial banks in Sri Lanka

2. Literature Review

2.1. The Concept of Information and Communication Technology (ICT)

Information Communication Technology in the form of innovation in which information can be stored, created, shared, or exchanged information and used for communication**.** Banking System development and sustainability essential for the adoption and use of ICT (Steven, 2002). The adoption and use of ICT are essential to the development and sustainability of banking. In the research of information and communication technology (ICT)

service innovation and its complementary strategies on customer loyalty toward ICT service providers, personalization is one of the critical strategies (Aduda & Kingoo, 2012). The adoption and use of ICT are fundamental to the development and sustainability of banking.

2.2. The Concept of E-Banking

Daniel (1999) defines electronic banking as the distribution of information and services by banks to clients through various delivery platforms that can be used with a PC or other gadgets. (Salehi & Azary, 2009) define E-banking as a process that involves an electronic association between customers and banks to prepare, manage, and control the customer's financial transactions by the bank. The Cambridge Dictionary defines E-banking as using the internet to organize, examine, and make changes to your bank accounts and investments electronically, or the use of the internet by banks to operate accounts and services.

2.3. Sri Lankan E- Banking Status

Sampath Bank first introduced electronic banking in 1988. They started by networking all their branches, allowing their customers to access their accounts at any branch. ATMs enable customers to withdraw money from ATMs (Jayasiri et al., 2016b). Banking practices in less developed nations are not the same as in developed nations (Kundi & Shah, 2009). Although the internet banking spread has been lower than most detects expected, and expansion has been stabilizing (Sullivan, 2000).

2.4. E-Banking Products and Services in Sri Lanka

2.4.1. Internet Banking

Internet banking includes bank transactions such as balance inquiries, account transfers, bill payments, and some even offer online credit applications over the internet using a PC without going to banks (Steven, 2002). Applications in developed and developing countries are considered an essential part of various studies on the impact of Internet banking on banks' work (Akhisar et al., 2015), (Hasan et al., 2002), (DeYoung, 2001) and (Gutu, 2014). Internet banking, as measured by the ratio of internet banking revenue generated from the internet to the amount of non-funded bank revenue (electronic card services income) (Njogu, 2014). In (Mwangi, 2013) states that ATM , mobile Banking and internet baking's fees and commission as a ratio of net bank income have used fees and commission as independent variables.

2.4.2. Branch Network

There were numerous limitations and difficulties with bank branches at the age of use of pre-ICT. The total number of accounts processed manual affiliates with dedicated staff members were limited (Maldeni & Jayasena, 2009). Network affiliates are described as automation and geographically different from the bank in the broad area of the network structure to facilitate the exchange of customer data (Abor, 2005). This system provides fast inter-industry banking, thus reducing the time and distance of restrictions. Banking services can facilitate through electronic

banking systems; banks must change the behaviour of their traditional clients by increasing their investment in advertising and electronic banking instruments to reduce visits to physical branches (Shahabi & Razi, 2019).

2.4.3. Automated Teller Machines (ATM) Services

The electronic card consists of a debit card linked to a local bank and a credit card, which usually related to a local and international bank (Ngango et al., 2015). ATMs, the management factors of banks, are closely related to various banking services, the establishment of good relations between the client and the bank (Hway-Boon & Yu, 2003). In addition, the ability of ATMs to continue operating even after bank hours ensures continuous performance (Adams, 2019). The number of ATMs installed by banks has a positive impact on their profitability by reducing labour and operating costs; electronic banking services can negatively affect the profitability of banks in the short term, which may be due to their investments in infrastructure and training; however, these services will have a positive impact on long-term profitability (Siam, 2006) and (Holden & Karsh, 2009a). In (Shahabi & Razi, 2019) states the number of ATM transaction as an independent variable.

2.5. E-banking Theories

2.5.1. Technological acceptance theory

The technology adoption model (TAM), introduced by (Davis, 1989) is one of the most cited models that researchers have used to study the underlying factors that motivate users to adopt and adopt a new information system.

2.5.2. Innovation Diffusion Theory

The dissemination of the theory of innovation developed by Rogers in 1962 explore factors that affect an individual or organization to adopt a new Technology. Rogers identified several innovative features that are vital influences on adoption behaviour.

2.6. Electronic banking profitability and efficiency

E-banking services enable maximizing profits (Karimzadeh & Reza Sasouli, 2013), (Sumra et al., 2011) and (Shahabi & Faezy Razi, 2019). (Gakure & Ngumi, 2013) found that ATMs, Online banking and point of sales increase the profitability of a commercial bank in Kenya. (Kaur & Kaur, 2008) stated that banks can efficiently deliver a product and service without opening new branches thanks to the improvement of electronic banking. (Aduda & Kingoo, 2012) investigate a strong positive relationship between overall bank performance and electronic banking in terms of bank performance and efficiency, customer retention and satisfaction.

2.7. Electronic Banking and Operating Costs

Electronic banking increases the bank's operating costs due to software research and development costs, amortization of purchased software, data processing costs, advertising costs and training costs for Employees who are required to provide such services (Sullivan, 2000). (Oyewole et al., 2013) also stated that the productivity of banks in Nigeria declined in the year of e-banking due to the high cost of IT. (Sumra et al., 2011) stated that banks

can cover implementation costs in a matter of months without waiting years because e-banking increases profits in a short period.

3. Methodology

3.1. Research Design

This research is studying according to "descriptive research design" because it is hoped to describe the quantitative data of commercial bank's operational performance through this research study. This study searches the relationship between electronic banking and the operational performance of commercial banks in Sri Lanka.

3.2. Conceptual Framework

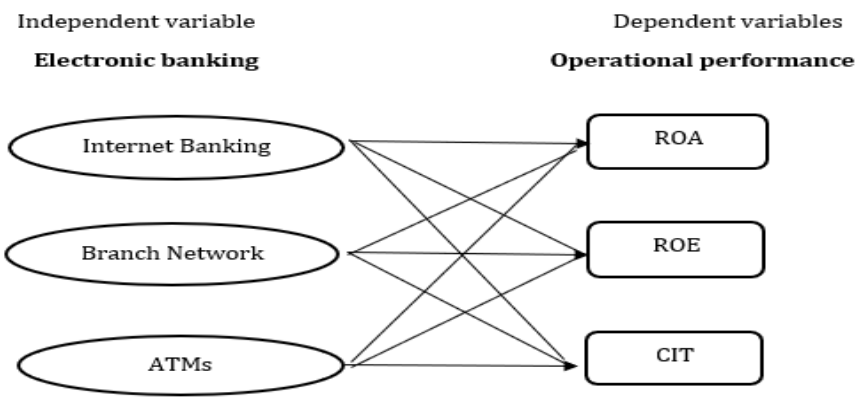

Figure 1: Conceptual Framework

Sources: Author Compiled

Table 3.1: Literature base to the conceptual framework

Variables	Studies/year	Measurement scale
	Independent variables	
Internet Banking	(Njogu, 2014)	Fees and commission
Branch Network	(Holden & Karsh, 2009b), (Shahabi & Faezy Razi, 2019)	Number of Branches
ATMs	(Shahabi & Razi), (Holden & Karsh, 2009b)	Number of ATMs
	Dependent variables	
Return on Assets	(Bougatef, 2017), (Tan et al., 2017)	Net income/Aver. assets
Return on equity	(Bougatef, 2017), (Tan et al., 2017)	Net income/ aver. equity
Cost to income ratio	(Bougatef, 2017)	Operational expenses/ operational income

Source: Author complied

3.3. Population and Sample

As this research based on the Sri Lankan context, the population interested in this study consist of 26 commercial banks represented the public listed companies in CSE. In this study, the sample selected from a stratified sampling method, represent the high value of assets base on 10 commercial banks were studied (Nakamura, 1991). Thus,

only ten commercial banks were examined: 79% of the target population. This study, sample consists of the BOC, PB, HNB, NTB, COMB, NDB, SAMP, DFCC, SEYL, and PAN ASIA.

3.4. Data Collection

The secondary data was collected using published and available annual report of the commercial banks in the period of 2014 to 2019. Even in 2015, Sri Lanka still has a less acceptable level of online banking. These studies are trying to determine the causes of this mentality upside down (Jayasiri et al., 2016b). Further, this study referred to each sampled bank website for more detail. (Maiyo, 2013) and (Shahabi & Faezy Razi, 2019) stated the data collection for 05 years. Therefore, the study, data covered the period of 2014 to 2019.

3.5. Data Analysis

For analyzing the data, the statistical application "E-views 11.0" is used. Based on the secondary data, descriptive statistics and multiple regression will measure the relationship between these variables. That data is transformed into a logarithm (Jimoh, 2019).

The multivariate regression equation was,

$$\text{Model 1 ROA} = \beta 0 + \beta 1\text{LogIB} + \beta 2\text{LogBN} + \beta 3\text{LogATMs} + \acute{\varepsilon} \quad (1)$$

$$\text{Model 1 ROE} = \beta 0 + \beta 1\text{LogIB} + \beta 2\text{LogBN} + \beta 3\text{LogATMs} + \acute{\varepsilon} \quad (2)$$

$$\text{Model 1 CIT} = \beta 0 + \beta 1\text{LogIB} + \beta 2\text{LogBN} + \beta 3\text{LogATMs} + \acute{\varepsilon} \qquad (3)$$

The following hypothesis developed based on the study variables.

H1: There is a significant impact of internet banking on a return on asset.

H2: There is a significant impact of branches network on return on assets.

H3: There is a significant impact of ATMs on return on assets.

H4: There is significant impact of internet banking on a return on equity.

H5: There is significant impact of branch network on return on equity.

H6: There is significant impact of ATMs on return on equity.

H7: There is a significant impact of internet banking on the cost to income.

H8: There is a significant impact branch network on the cost to income.

H9: There is a significant impact of ATMs on the cost to income**.**

4. Finding And Discussion

4.1. Test in Normality

Table 4.1: Result of the normality

	Skewness statistic	Kurtosis statistic	Jarque-Bera	Probability value
ROA	-0.021530	2.700167	0.229385	0.891640
ROE	-0.070237	3.058618	0.057922	0.971454
CTI	0.359642	3.810177	2.934392	0.230571

Source: Author complied

The test of normality carried out for the component's identification from the component's analysis. For the examination of normality, the skewness and kurtosis were calculated (Eze & Egoro, 2016). As cited in table 1.1, it can be concluded that with the statistics generated under the skewness and kurtosis test, all statistics of skewness were nearly 0, and kurtosis have been less than 3 for the variables are ROA, ROE, and CTI. Also, JB is very close to zero. So, the researcher can be concluded that data usually is distribute.

4.2. Test in Stationary

Table 4.2: Result of the unit root

Levin, Lin & Chu t (at level)*			
De. Variables	**Probability**	**In: Variables**	**Probability**
Return on assets	0.0000	Internet banking	0.0000
Return on equity	0.0167	Branch network	0.0002
Cost to income	0.0000	ATMs	0.0000

Source: Author complied

According to the test, under the Levin, Lin & Chu method probability value is less than 0.05 its' at the level also. It concludes that all variables are stationary.

4.3. Model Specification

This study result shows a probability value of ROA, ROE, and CTI which is less than 0.05 and requires continuing with the fixed effect, multiple regression model. If the probability value is less than 0.05, it must continue the analysis with the a fixed effect model (Ali & Puah, 2019).

Table 4.3: Model summary

	R^2	Adj R^2	D.W stat	F-stats	P-value
ROA	0.728021	0.658579	1.816968	10.48395	0.000000*
ROE	0.623208	0.527006	1.679105	6.478101	0.000001*
CTI	0.821965	0.776509	1.753845	18.08270	0.000000

Source: Author complied

The finding in table 1.3 shows that the R^2 is more than 62%, and the Adjusted R^2 value is more than 52% in all models. On that mean, there was a positive relationship between all determinants of electronic banking and operational performance. Durbin Watson test value is nearly 2 it indicates that presence the of autocorrelation (Eze & Egoro, 2016). F-statistic show that the overall table is statistically significant.

4.4. Regression Analysis:

Table 4.4: Summary of the regression result

	Coefficient (β)		
	ROA	**ROE**	**CTI**
(Constant)	0.100839	0.874692	-0.361523
Internet banking	0.001699	0.012868	-0.032616
Branch Network	-0.00793	-0.129291	-0.116865
ATMs	-0.014740	-0.047738	0.410052

Source: Author complied

According to the table 1.4, ROA has significant positive impact on Internet banking and also significant negative r

ROA = 0.1008 + 0.0017logIB – 0.0079logBN – 0.0147ogATMs + μ (1)

p between ROE and internet banking and a negative relationship between BN and ATMs. CTI has negative significance with IB and BN. And the positive significant relationship with ATMs also. Therefore, regression models is build as follows,

ROE = 0.875 + 0.0129logIB – 0.1293logBN – 0.0477logATMs + μ (2)

CIT = -0.3615 – 0.0326logIB – 0.1169logBN+ 0.4101logATMs + μ (3)

Table 4.5 Summary of the hypothesis testing

Hypothesis	Sig.	Decision
H1: There is a significant impact of internet banking on return on asset.	.0127	Accepted
H2: There is a significant impact of branches network on return on assets.	.0021	Accepted
H3: There is a significant impact of ATMs on return on assets.	.0063	Accepted
H4: There is a significant impact of internet banking on return on equity.	.3330	Rejected
H5: There is a significant impact of branch network on return on equity.	.0111	Accepted
H6: There is a significant impact of ATMs on return on equity.	.6467	Rejected
H7: There is a significant impact of internet banking on the cost to income.	.0194	Accepted
H8: There is a significant impact branch network on the cost to income.	.0240	Accepted
H9: There is a significant impact of ATMs on the cost to income.	.0003	Accepted

Source: Author complied

4.5. Correlational Matrix

Table 4.6: Result of multicollinearity

	ROA	ROE	CTI	IB	BN	ATMs
ROA	1.00000					
ROE	-	1.00000				
CTI	-	-	1.00000			
IB	0.311169	0.309469	-0.02594	1.00000		
BN	0.592423	0.460506	-0.14416	0.663140	1.00000	
ATMs	0.593569	0.562533	0.017271	0.411172	0.779569	1.00000

Source: Author complied

As the result shown in table 1.6 there are relatively low data correlations among the independent variables. These low correlation coefficients show that there is no multicollinearity problem, thus enhancing the reliability for regression analysis due to the coefficient is less than 0.8.

4.6. Descriptive Analysis

Table 4.7: Result of descriptive

Statistic	ROA	ROE	CTI	Internet Banking	Branches	ATMs
Mean	0.013450	0.165340	0.491467	20.22056	5.552784	5.271094
Median	0.013500	0.163450	0.490500	20.77970	5.578768	5.283460
Maximum	0.019000	0.374000	0.642000	22.24211	6.762730	6.606298
Minimum	0.005000	0.063600	0.359000	13.13231	4.001333	4.204387
Std.div	0.003100	0.052852	0.078725	2.008397	0.872390	0.741078
Skewness	-0.35453	1.103122	0.076641	-1.75925	-0.15433	0.463352
Kurtosis	2.913685	6.095861	2.074835	6.048063	1.534110	2.035932
Jarque-Bera	1.275590	36.12967	2.198565	54.17652	5.610279	4.470524
Prob:	0.528456	0.000000	0.333110	0.000000	0.060498	0.106964

Source: Author complied

According to table 1.7 ROA have a mean of 0.013450 while the median of the variable shows a value of 0.013500. The deviation from the mean value of 0.003100. The argument is that variables are normality distribute since there is not a crucial gap between the mean and standard deviation. The maximum value and the minimum value are 0.019000, 0.005000 respectively. Similarly, the mean value of ROE is 0.165340 with a standard deviation of 0.052852 and mean value of Cost to income (CTI) is 0.491467, and the deviation is 0.078725. The maximum values are 0.374000, 0.642000 and minimum values are 0.063600, 349000 respectively.

The minimum value of internet banking is 13.13231, maximum value of 22.24211, that max. Value represented the Sampath bank in 2019. Further, mean is 20.22056 and Standard deviation is 2.008397. The data were not normality due to commercial banks' performance are high in some banks, and some are less performance in this sector(Nakamura, 1991). The branch network of the commercial banks has a mean of 5.552784 while the median is 5.578768. The maximum and minimum values of the branches are 6.762730 and 4.001333. In contrast, the total number of observations is 60 of all the study variables.

5. Conclusion

Electronic banking allows you to process payments and transactions faster and easier than it used to be. Customers can access funds and transfer funds between accounts, pay bills and shop 24 hours a day using electronic means such as ATMs, mobile phones, or computers. E-banking has also improved the relationship between bank performance and operational performance. Further, this study discovered that BOC is the highest performing bank in Sri Lanka. CB has recorded the second-highest performance. The findings suggest that banks with extended branch network have higher profitability and efficiency. The significant relationship with all dependent variables. This study found that internet banking has a slow impact with ROE due to impaired unavailability of infrastructure and lack of supportive legislation for internet banking (Nyangosi et al., 2009) and ATMs of the bank has an insignificant relationship with ROE due to some bank performances are high. Some are low (Nakamura, 1991).

However, the ROA and CTI highly significant with internet banking, ATMs, and branch network. Hence, the banking and ATMs of banks have affected Sri Lankan banking sector by building it more profitability.

Therefore, these symptoms reflected that number of ATMs of bank has positively affected bank performance. According to these findings, this study discovered a significant positive impact of internet banking, branch network and ATMs, on the operational performance of commercial banks in Sri Lanka.

5.1. Recommendation

Commercial banks must invest heavily in technology, as this will significantly contribute to the introduction of e-banking technologies, which will affect the operational performance of commercial banks. This study discovered that e-banking increases bank performance by offering value-added products and services through ICT. Therefore, the bank can be acquired appropriate technology by focusing on their needs and goals rather than developing technology because other banks have it. Commercial banks must continue to invest in e-banking, impacting banks' operating performance, which operating costs and increases profits. Internet banking is becoming a more popular instrument in Sri Lanka. Therefore, if the banks take remedial actions to develop internet banking, it positively affects bank performance. The branch network on e-banking is also a vital factor to improve the bank performance.

Additionally, the study can further expand to evaluate whether e-banking has helped improve bank performance, especially in rural areas. Further, this study found that the number of ATMs has affected the operational

performance of commercial banks. However, the intensity of the incremental bank performance not considered through this study. Hence, it is vital to carry out further studies on this matter in due course

5.2. Limitation of the Study

Sri Lanka's financial market consists of capital markets, the insurance industry, and the banking sector. However, this study is limited only to the banking sector. We have therefore concluded that the investigation is limited to commercial banks operating in the country.

The study used secondary data that may be general and inaccurate and cannot help companies decide on curable issues. Information and data may not be very accurate, and the source of the data must be adequately verified.

5.3. Direction of the further research

The study was conducted based on Sri Lanka commercial banks. A future scholars can use the model for other financial market or other banking sectors in other countries.

This study was limited to commercial banks. It can be learnt to accept and use ICT by microfinance organizations and other financial institutions.

The study found a small value between online banking and efficiency of service delivery, as seen by the central bank. An investigation consisting of should be conducted for a longer period and the size of a larger sample.

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