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

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Abstract

The banking industry has experienced a dramatic change resulting from the adoption of Information Communication Technology. The data was gathered from 2014-2019 concerning internet banking, branch network and Automated Teller Machine, based on the annual reports of selected ten banks. Regression analysis was done for the period to determine the effects of e-banking on commercial banks' operations. Data is stationary at the level and normally distributed. Under the fixed-effect model, this study found a positive significant relationship among Internet Banking return on Assets, negative significant with Return on Assets and Branch Network, Automated Teller Machine. Also, an insignificant relationship between Return on Equity and Internet Banking so, internet banking is familiar with a recent year in Sri Lanka. Cost to Income and Internet Banking have a negative significance and other all variables are a significant relationship with Cost to Income. overall models statistically significant. Results suggest that E-banking has significantly improved the bank operational performance in Sri Lank from 2014 to 2019.

Keywords-: E-baking, branch network, operational performance, profitability, Efficiency

1. INTRODUCTION

1.1 Background of the study

Over the last few decades, the banking industry has experienced a dramatic change resulting from the adoption of Information Communication Technology. Financial institutions including banks have moved from traditional paper and manual operations to electronic operations such as electronic banking (Salehi & Alipour, 2010). Although the latest techniques of E-banking are said to provide effective services and reduce operating costs. Implementing E-banking involves substantial risk and a cost as to how banks should integrate the E-banking with existing service successfully. This study aims to investigate how the expansion of e-banking affects the profitability and efficiency of the bank through

analyzing the data of companies under the banking sector in the Colombo Stock Exchange in Sri Lanka.

1.2 Problem statement

E-banking technology has been taken off the Sri Lankan banking industry replacing the traditional banking procedures. This is reflected in the expanded volume and complexity of banking operations, expanded developments and assortments in product and service conveyance. The banks with E-banking facilities can outperform their counterparts in terms of profitability (Malhotra & Singh, 2009). E-banking is gradually creating a cashless society (Aduda & Kingoo, 2012). E-banking has a strong impact on the overall performance of banking because it improves the efficiency and effectiveness of the banks (Olorunsegun, 2010). E-banking is beneficial for banks and customers, because it reduces the cost of customers in terms of reduced waiting time extra paper works, reduces the operating cost for banks.

According to (Sumra et al., 2011b), e-banking increases the cost to the customers as well since it includes the bank charges commissions and service charges for e-banking. (Oyewole et al., 2013) mention that their performance in the banks in Nigeria has decreased in the year of adoption to e-banking, because of the high cost of ICT. Furthermore, e-banking creates a high cost which is associated with software research & development, amortization of purchase software, data processing, promotional expenses, and employee training (Sullivan, 2000).

It is not well-known whether the adoption of E-banking creates monetary value for banks. This is because not every increase in customer satisfaction moves into the higher operations performance and benefits, particularly in the case of very expensive investment in innovation like ATMs. Also, the extent to which E-banking can affect bank operations varies from bank to bank and from country to country. And only a limited number of studies have been conducted in the Sri Lankan context to identify the impact of E-banking on the profitability of banks 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 policymakers 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

1) Identify the relationship between E-banking facilities and the performance of commercial banks in Sri Lanka.

2) Identify the extent of E-banking usage of commercial banks in Sri Lanka.

3) Identify the effect of initial investment on ATMs on the performance of commercial banks in Sri Lanka.

1.4 Objectives of the study

Establish the impact of electronic banking on the performance of commercial banks in Sri Lanka.

Establish the extent of mobile and internet banking usage in Sri Lankan commercial banks.

Establish the impact of capital investment on ATMs on the performance of commercial banks in Sri Lanka.

1.5 Significant of the Study

This research provides evidence regarding the degree of adoption of ICT in the banking industry. The importance of electronic banking has an impact on customers and banks. This study is of great importance to both parties as it does not only give the impact of E-banking on bank operations but also it investigates the factors deciding or constraining the supply of electronic services.

The study gives a better understanding of how electronic banking facilitates efficiency through electronic payment processing, reduced cost of operations, increased banking penetration, reduction in risk of cash related crimes, access to credit and fast access to banking services (Jayasiri et al., 2016a).

- The study gives a better knowledge of the issues under investigation and sharpens research skills and the study fills the gaps in previous studies.

- It gives knowledge of 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.

2. METHODOLOGY

2.1 Research design

This research is studied according to “descriptive research design” because this research study it is planned to describe the quantitative data of commercial banks’ operational performance. This study searches the relationship between electronic banking and the operational performance of commercial banks in Sri Lanka. The research design is defined as it is the plan for collecting and utilizing data so that desired information can be obtained. Research design is the conceptual structure within which research would be conducted.

2.2 Conceptual framework

The conceptual framework was designed based on logical and sequential design. They are variables that affect dependent variables that can positive or negative. This means that when you increase it by one unit or reduce a unit in independent variables, there should also be an

increase or increase in reduce dependent variables. As illustrated in figure 1, three variables are taken into account while e-banking is taken as the main variable of this study.

2.3 Population and sample

As this research is based on the Sri Lankan context, the population interested in this study consists of 26 commercial banks represented by the public listed companies in CSE. In this study, the sample was selected from a stratified sampling method, representing the high value of assets base out of 10 commercial banks were studied (Nakamura, 1991). Thus, only 10 commercial banks were studied: 79% of the target population. This study sample consists of the BOC, PB, HNB, NTB, COMB, NDB, SAMP, DFCC, SEYL, and PANS ASIA (Table 2).

2.4 Data collection

The secondary data was collected using published and available annual reports 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, and 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 collected 5 years. Therefore, in this study data covered the period of 2014 to 2019.

2.5 Data analysis

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

Model 1 ROA = β0 + β1LogIB + β2LogBN + β3LogATMs + ἑ……...(1)

Model 1 ROE = β0 + β1LogIB + β2LogBN + β3LogATMs + ἑ ……..(2)

Model 1 CIT = β0 + β1LogIB + β2LogBN + β3LogATMs + ἑ ……(3)

Whereby:

ROA = Return on Assets

ROE = Return on Equity

CTI = Cost to Income

IB = internet banking

BN = branch network

As above mention regression examples will be used to build a multiple regression analysis for the return on assets, return on equity and cost to income. Further, a correlation matrix uses for the test multicollinearity.

2.6 Hypothesis of the Study

The nine hypothesises developed based on the model (Figure 1). The objectives were in line with the hypothesis which will lead to the outcome.

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

H2: There is a significant impact of Branch Network on return on assets.

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

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

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

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

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

H8: There is a significant impact of branch networks on the cost of income.

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

3. RESULT

3.1 Test in Normality

The test of normality was carried out for the component's identification from the component's analysis. For the test of normality, the skewness and kurtosis were calculated (Eze & Egoro, 2016). As cited in table 3, can be concluded that with the statistics generated under 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. The researcher can be concluded that data is normally distributed.

3.2 Test in stationary

According to table 4, the test of under the Levin, Lin & Chu method probability value is less than 0.05 it's at the level also. It concludes that all variables are stationary.

Model specification

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

From the finding in Table 5, the R-Squared (R^2) is more than 62% and the Adjusted R-Squared (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's test value is nearly 2 it indicates the presence of autocorrelation (Eze & Egoro, 2016). F-statistic shows that the overall table 6, is statistically significant.

3.3 Regression analysis

According to table 6, ROA has a positive significant impact on Internet banking and also a negative significant relationship with branch networks and ATMs. There is a positive relationship between ROE and internet banking and a negative relationship between BN and ATMs. CTI has a negative significance with IB and BN. And the positive significant relationship with ATMs also.

ROA = 0.1008 + 0.0017logIB – 0.0079logBN – 0.014ogATMs + μ…(1)

ROE = 0.875 + 0.0129logIB – 0.1293logBN – 0.047logATMs + μ….(2)

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

3.4 Correlational matrix

According to (Jäntschi et al., 2015) indicated that assumptions that allow testing is that the predictors are not too highly correlated when the correlation of more than 0.8 may be problematic. As cited in table 6, concluded that analysis of correlation of statistics showed this assumption has been met.

As the result shows in Table 7, there are fairly low data correlations among the independent variables. These low correlation coefficients show that there is no problem of multicollinearity, thus enhancing the reliability for regression analysis due to the coefficient being less than 0.8**.**

3.5 Descriptive analysis

According to table 8, ROA has 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. This means that variables are normality distributed since there is no wide 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 22.2421. The value represents the Sampath bank in 2019.

Further, the mean is 20.22056 and Std. The deviation is 2.008397. That means, 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. While the total number of observations is 60 of all the study variables.

4. DISCUSSIONS

4.1 Hypotheses

According to the natural logarithm in equation (1) is adopted, most panel data have unequal variance, thus the natural logarithm support to stabilize the variation of the performance in the commercial banks, which help to continue this analysis (Eze & Egoro, 2016) and (Orji et al., 2018).

$$\boldsymbol{ROA = \beta 0 + \beta 1 logIB + \beta 2 logBN + \beta 3 logATMs + \mu} \quad \textbf{..... (1)}$$

According to the results of the regression, Internet banking, Branch network and ATMs explained 72.80% of the variance in return on assets. (R^2 = .7280, F = 10.48, p < 0.000). The result shows that in table 9, internet banking is statistically significant at 5% level and Branch network, ATMs coefficient are statistically significant at 1% level. This implies that internet banking has a positive relationship with return on assets and others are negative.

As a result, indicate previously that these constructs are related and support this assumption and therefore, the researcher conducted a regression analysis to test the hypotheses of the study.

1) H1: There is a significant impact of internet banking on a return on assets.

According to the regression result, the significant level is 0.0127 at t statistic 2.592 which is less than 0.5 (5%) standard level. It indicates that there is a significant impact of internet banking on a return on assets. Arriving at a β value of 0.001699 further indicated that the impact is positive. Hence, internet banking has a positive significant impact on return on assets, H1 is accepted.

2) H2: There is a significant impact of branch network on return on assets. As cited in table 8, indicated that the significance level is 0.0021 at t statistic -3.254 which is less than 0.01 (1%) standard levels. Arriving at a β value of -0.007932 further indicated that the impact is negative. It indicates that there is a significant impact of branches network on return on assets also. Accordingly, H2 is accepted.

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

The result reveals that the coefficient of ATMs on return on assets β 0.014740. It indicates that ATMs has a negative relationship with bank profitability at a 5% level. That means, increasing the ATMs by one, and the return on assets decrease by 0.0147. Finally, indicated that there is a negative significant impact of ATMs on

return on assets. This study does not reject the H3.

Therefore, regression model can be built at below,

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

The established 2nd regression equation was;

$$\boldsymbol{ROE = \beta 0 + \beta 1 logIB + \beta 2 logBN + \beta 3 logATMs + \mu \ldots\ldots\ldots\ldots (2)}$$

According to above table 11, the study showed that the ratio of operational results of commercial banks in Sri Lanka can be considered by changes in internet banking, branch network, and ATMs. Based on the results of the R correlation, the study showed that there is a strong correlation among the bank profitability of 10 commercial banks and internet banking, branch network, and ATMs. It is 0.623208 (62.32%). Based on the coefficient results, the study showed that there is a positive and negative relationship between bank profitability and these variables.

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

According to the regression result, internet banking's significant level is 0.3330 at t statistic 0.978233 which is greater than 0.05 standard level. It indicates that there is no significant impact of internet banking on a return on equity. Accordingly, hypothesis 4 is rejected.

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

As cited in table 10, indicated that the significant level is 0.0111 at t statistics -2.643279 which is less than 0.05 standard level. It indicates that there is a significant impact of branch network on return on equity. Arriving at a β value of -0.129291 further represented the negative impact. And branch network has a negative significant impact on return on equity. Accordingly, H5 is accepted.

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

As cited in table 9, indicated that the significant level is 0.6467 at t statistic -0.461330 which is greater than 0.05 standard level. It indicated that there is no significant impact of ATMs on return on equity. Accordingly, H6 is rejected.

Therefore, a regression model can be built at below,

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

The OLS linear regression equation based on the relation of the above variables for models 3 is econometrically stated as;

$$\boldsymbol{CIT = \beta 0 + \beta 1 logIB + \beta 2 logBN + \beta 3 logATMs + \mu \ldots\ldots\ldots (3)}$$

The study also found that there is a statistically significant link between the operational performance (Efficiency) of commercial banks and the internet

banking, branch network and ATMs.

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

Accordingly, to the regression results, since the significant level is 0.0194 at t statistic -2.421522 which is less than 0.05 standard level. It indicates that is a significant impact of internet banking on the cost to income (Refer to table 11 for more details). Arriving at a β value of -0.032616 further indicated that the impact is negative. And internet banking has a negative significant impact on the cost of income. Accordingly, accepted the H7.

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

As cited in table 11, indicated that the significant level is 0.0240 at t statistic -2.333492 which is less than 0.5 (5%) standard level. It indicates that there is a significant impact of branch network on the cost to income. Arriving at a β value of - 0.116865 further indicated the negative impact. And branch network has a negative significant impact on the cost to income. Accordingly, H8 is accepted.

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

As cited in table 12, indicated that the significance level is 0.0003 at t statistic 3.870187which is less than 0.01 (1%) standard levels. Arriving at a β value of 0.410052 further indicated that the impact is positive. It indicates that there is a significant impact of ATMs on the cost to income also. Accordingly, H9 is accepted.

Therefore, a regression model can be built at below

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

4.2 Graphical representation of the variables used

To show the trend, we showed variables about the study, variables were built. The following section reports on trends in variables in View.

4.2.1 Graphical representation of the dependent variables

The profitability of the bank was measured by the performance of the assets and equity. The researcher calculated the impact of dividing banks' net profit after tax by total assets and dividing the banks' net profit after tax by total equity period of study. The efficiency of the bank was measured by the CTI which calculated the impact dividing banks' operating income by operating expenses. Figure 3 shows that the return on commercial banks' assets has declined from 2014 to 2019, ROE has grown slowly from 2015 to 2017 and growing steadily from 2018 to 2019. And the cost of the commercial banks' income has grown steadily from 2014 to 2015, declining from 2014 to 2018 also.

4.2.2 Graphical representation of the Independent variables

This study uses the fees and commission on the internet banking users, the number of branches and the number of ATMs installed by commercial banks as a measure of e-Banking. Figure 3, shows that independent variables have been varied from 2014 to 2019. Figure 4, shows the number of branches has been decreasing slowly since 2014. And shows that the number of ATMs has been increasing steadily since 2014, and internet banking fees and commission charges fluctuate parlay with ATMs. According to figure 4.2 ATMs and internet banking has decreased from 2017 to 2018 and gradual increase in average level since 2018.

5. CONCLUSION

5.1 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 networks have higher profitability and efficiency. So it has a significant relationship with all dependent variable and this study found that internet banking has a slow impact on 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 performance are high and some are low (Nakamura, 1991). In this finding, other ROA and CTI are highly significant with internet banking, ATMs and branch network. Hence, the internet banking and ATMs of the bank has affected the Sri Lankan banking sector by building it more profitability.Therefore, these symptoms reflected that number of ATMs of the bank has positively affected the 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.

5.2 Recommendations

Commercial banks must invest heavily in technology, as this will greatly 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 the right technology by focusing on their needs and goals rather than acquiring technology because other banks have it. Commercial banks must continue to invest in e-banking, impact on 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 improve the bank performance. The branch network on e-banking is also a vital factor to improve bank performance. Additionally, the study can also be extended to evaluate whether e-banking has helped to improve bank performance, especially in rural areas.

Further, this study found that the number of ATMs has affected increase the operational performance of the commercial bank. However, the intensity of the incremental bank performance is not considered in this study. Hence, it is important to carry out further studies on this matter in due course.

5.3 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 study is limited to commercial banks operating in the country.

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

The study used panel data. Equipment data was collected and analysed. All limitations of the panel analysis tool used to apply to this study.

Finally, the conclusions of the study are inconclusive, as the study focuses on six determinants of operational indicators. In addition, the availability of data determines the elements of the study, not any statistical or probabilistic criteria. Therefore, caution should be exercised when generalizing the results of the study.

5.4 The direction of the further research

The study was conducted only in Sri Lanka commercial banks. Research can be done for other financial markets 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.

The study found that there is a small value between online banking and the efficiency of service delivery, as seen by the Central Bank. An investigation consisting of should be made for a longer period, as well as the size of a larger sample.

APPENDIX

Independent variable
Electronic banking:

Dependent variables
Operational performance:

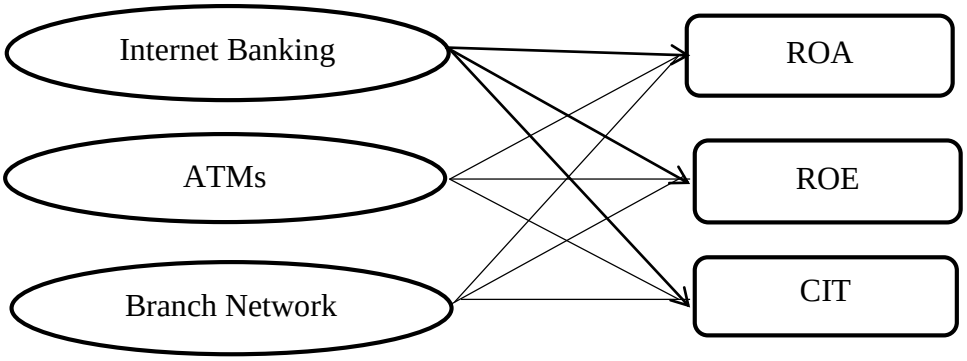

Figure 1: Conceptual framework of the study

Table 1: Literature base to the conceptual framework

Variables	Studies/year	Measurement scale
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
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

Sources: Author's created

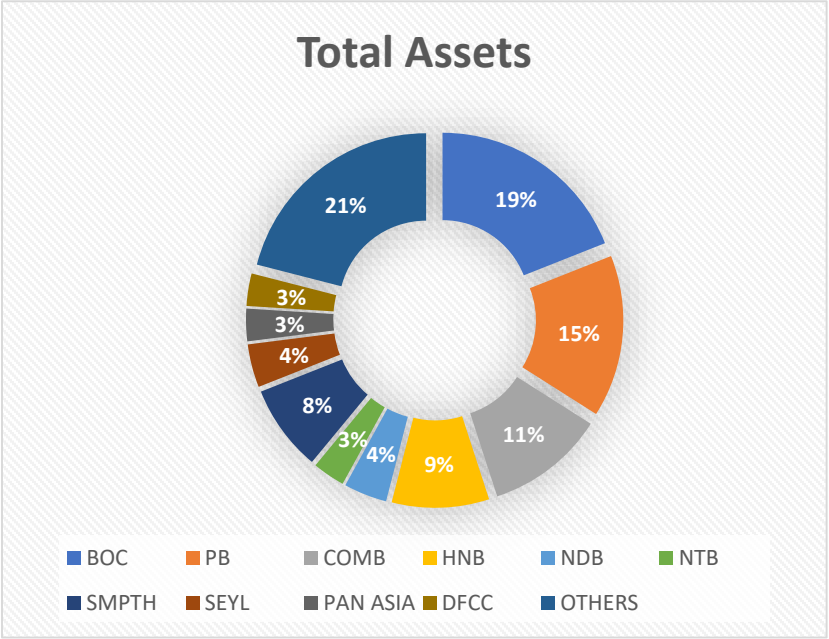

Figure 2: Total assets of sample selection (Sources: Central bank annual report)

Table 2: Sample selection- Total assets

Banks	% OF TOTATL ASSETS
BOC	19
PB	15
COMB	11
HNB	9
NDB	4
NTB	3
SMPTH	8
SEYL	4
PAN ASIA	3
DFCC	3
OTHERS	21
Total	100

Sources: Central bank annual report

Table 3: 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

Sources: E-Views data

Table 4: Result of the Unit Root

Levin, Lin & Chu t (at level)*			
De. Variables	Prob	In: Variables	Prob
ROA	0.0000	Internet banking	0.0000
ROE	0.0167	Branch network	0.0002
CTI	0.0000	ATMs	0.0000

Sources: E-Views data

Table 5: 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

Sources: E-Views data

Table 6: 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	-0.007932	-0.129291	-0.116865
ATMs	-0.014740	-0.047738	0.410052

Sources: E-Views data

Table 7: Result of Multicollinearity

1	**2** ROA	**3** ROE	**4** CTI	**5** IB	**6** BN	**7** ATMs
8 ROA	**9** 1.0000	**10**	**11**	**12**	**13**	**14**
15 ROE	**16** -	**17** 1.0000	**18**	**19**	**20**	**21**
22 CTI	**23** -	**24** -	**25** 1.0000	**26**	**27**	**28**
29 IB	**30** 0.3112	**31** 0.309469	**32** -0.02594	**33** 1.0000	**34**	**35**
36 BN	**37** 0.5924	**38** 0.460506	**39** -0.14416	**40** 0.66314	**41** 1.0000	**42**
43 ATMs	**44** 0.5936	**45** 0.562533	**46** 0.01727	**47** 0.41117	**48** 0.7796	**49** 1.000

Sources: E-Views data

Table 8: Result of Descriptive

Statistic	**ROA**	**ROE**	**CTI**	**Internet Banking**	**Branches**	**ATMs**
Mean	0.01345	0.16534	0.49147	20.2206	5.55279	5.27109
Median	0.01350	0.16345	0.49050	20.7797	5.57877	5.28346
Maximum	0.01900	0.37400	0.64200	22.2421	6.76273	6.60629
Minimum	0.00500	0.06360	0.35900	13.1323	4.00133	4.20439
Std.div	0.00310	0.05285	0.07873	2.00839	0.87239	0.74108
Skewness	-0.35454	1.10312	0.07664	-1.7596	-0.15434	0.46335
Kurtosis	2.91368	6.09586	2.07483	6.04806	1.53411	2.03593
Jarque-Bera	1.27559	36.1296	2.19856	54.1765	5.61027	4.47052
Prob:	0.52845	0.00000	0.33311	0.00000	0.06049	0.10696

Sources: E-Views data

Table 9: Summery of the Regression Result

	Coefficient			
	β	Std. Error	t. stat	Significant
(Constant)	0.100839	0.019180	5.257537	0.0000*
Internet banking	0.001699	0.000655	2.591802	0.0127**
Branch network	-0.007932	0.002437	-3.254418	0.0021*
ATMs	-0.014740	0.005156	-2.858863	0.0063*

Sources: E-Views 11.0

Note: Dependent variable is Return on Assets (ROA)

The symbols (*), (**) and (***) indicate statistical significance at 1% and 5% and 10% level, respectively.

Table 10: Summery of the regression result

	Coefficient			
	β	**Std. Error**	**t. stat**	**Significant**
(Constant)	0.874692	0.384935	2.272313	0.0277**
Internet banking	0.012868	0.013155	0.978233	0.3330
Branch network	-0.129291	0.048913	-2.643279	0.0111*
ATMs	-0.047738	0.103480	-0.461330	0.6467

(Sources: E-Views 11.0)

Note: Dependent variable is Return on equity (ROE)

The symbols (*), (**) and (***) indicate statistical significance at 1% and 5% and 10% level, respectively.

Table 11: Summery of the regression result

	Coefficient			
	β	**Std. Error**	**t. stat**	**Significant**
(Constant)	-0.361523	0.394130	-0.917268	0.3637
Internet banking	-0.032616	0.013469	-2.421522	0.0194**
Branch network	-0.116865	0.050082	-2.333492	0.0240**
ATMs	0.410052	0.105952	3.870187	0.0003*

(Sources: E-Views 11.0)

Note: Dependent variable is Cost to Income (CIT)

The symbols (*), (**) and (***) indicate statistical significance at 1% and 5% and 10% level, respectively.

Table 12: Summary of the hypothesis testing

Hypothesis	Sig.	Decision
H1: There is a significant impact of internet banking on return on assets.	.0127	Accepted
H2: There is a significant impact of Branch Network on return on assets.	.0021	Accepted
H3: There is a significant impact of number 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 number of ATMs on return on equity.	.6467	Rejected
H7: There is a significant impact of internet banking on cost of income.	.0194	Accepted
H8: There is a significant impact of branch network on cost of income.	.0240	Accepted
H9: There is a significant impacr of number of ATMs on cost of income.	.0003	Accepted

Sources: E-Views 11.0

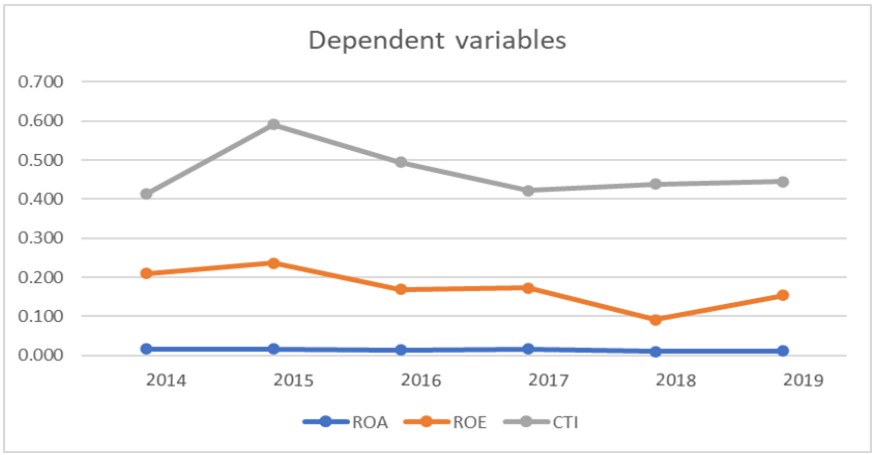

Figure 3: Graphical representation of the ROA, ROE and CTI

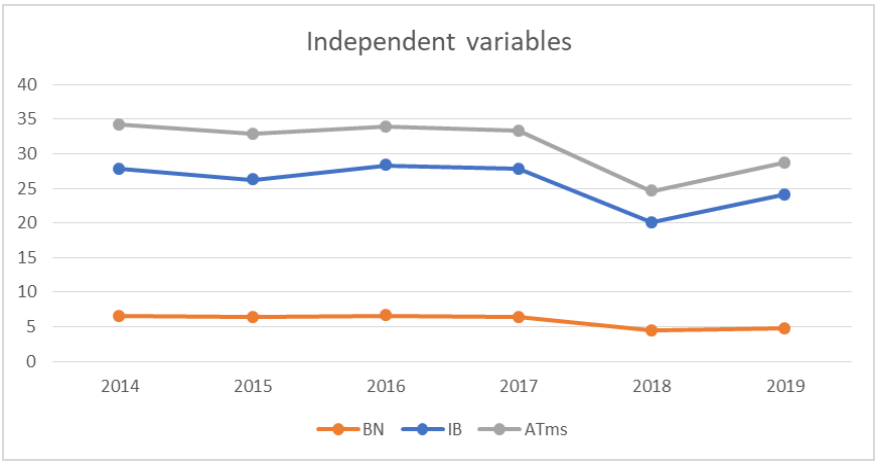

Figure 4: Graphical representation of the average values of IB, BN and ATMs

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