Innovations

EFFECT OF ELECTRONIC BANKING SERVICES ON PERFORMANCE OF ETHIOPIAN BANKS

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Abstract

Examining the impact that POS, ATM, mobile banking, and bank size have on the performance of commercial banks was the study's explicit goals. The study solely employed a quantitative methodology. Nine commercial banks were chosen using a purposive selection technique and their secondary data for the five-year period of 2017 - 2021 was collected. Fixed effect panel regression results showed that the number of ATMs has a negative and statistically significant impact on bank performance as measured by ROA, the number of POS machines was found to have a negative but statistically insignificant impact on bank performance. On the other hand, the number of mobile banking users has positive and statistically significant impact. Finally, the number of ATMs was found to have no effect on the bank performance.

Key Words: 1.Electronic Banking; 2.Bank's Performance; 3. Commercial banks; 4.ROA

1. INTRODUCTION

1.1 Background of the study

The phrase "electronic banking" refers to automated distribution of banking goods and services to clients via online, interactive electronic channels. Through a public or private network, such as the internet, electronic banking enables users to access their accounts, complete transactions, and get financial products and services (Driga and Isac, 2014).

The use of e-banking has changed over time. Automated Teller Machines (ATMs) were one of the earliest ways to give clients electronic access, according to Shah and Clarke (2009). The development of computer networks allowed for ATM. Barclays Bank was the first bank to utilize an ATM. The groundbreaking idea of telephone banking then entered the scene, enabling banking to be done from any location as long as telephones were accessible (Ogare, 2013)

Technology innovation has significantly improved the standards of service delivery in the banking sector (Ogare, 2013). New technologies have the power to alter how routine chores are carried out in the banking business. Most tasks that were previously completed by bank cashiers in a traditional manner are now carried out via e-banking, including ATMs, for a great deal less money. Technology advancements have made it possible for customers to conduct their banking online. (Karimzadeh et al, 2014). In today's very competitive banking sector, e-banking offers banks a number of competitive benefits. Compared to branch or even phone transactions, e-banking transactions are far more affordable (Shah and Clarke 2009).

E-banking can provide an efficient means of conducting business and enhancing positive client relationships by offering top-notch services and cutting-edge goods that can be tailored to specific consumer needs (Shah and Clarke 2009). Additionally advantageous are the simpler paperwork and transaction tracking, lower printing, maintenance, and administrative expenses, availability of many payment methods, etc (Karimzadeha et al 2014).

On the contrary, there are difficulties with e-banking services that have seriously slowed its development. Lack of proper ICT infrastructure, security issues, frequent power and internet outages, and lack of client awareness are some of the difficulties that prevent e-banking services from enhancing the efficiency of banks.

In Ethiopia, e-banking is still in its infancy. By deploying ATMs in late 2001, the Commercial Bank of Ethiopia (CBE) introduced e-banking to Ethiopia for the first time. E-banking systems, which include internet banking, mobile banking (MB), and agent banking, are increasingly being adopted by banks nowadays. Many banks are now investing heavily on technology to maintain and modernize their infrastructure.

Hence, this study explores how Ethiopian commercial banks' performance is affected by e-banking services.

1.2 Statement of the Problem
Due to the quick development of information technology and the fierce competition in the banking industry, the use of e-banking as a channel of distribution for financial goods and services has become quite widespread. In anticipation that the new technology system will increase their profitability and market share, financial institutions have been pouring billions of dollars into it. However, if the buyers do not embrace or fully utilize it, the anticipated return could be smaller. Additionally, there is growing worry that e-banking is not producing the desired outcomes (Nyangena and Muturi, 2015).

Despite the importance of e-banking for bank performance, Arisa and Muturi (2015) claim that not enough study has been done on how it affects banks' performance.

According to the existing literature, very few studies on e-banking services in Ethiopia have been conducted. Prior research by Ayana (2014), Gardachew (2010), and Berhane (2015) concentrated on the adoption of e-banking services, while Girma (2016) and (Dawit, 2017) examined the effects of IT investment on the financial performance of Ethiopian banks. One might infer from the foregoing arguments that little research has been done on the impact of e-banking services on the efficiency of Ethiopian banks. Therefore, the purpose of this study is to investigate how Ethiopian banks' performance is impacted by e-banking services.

1.3 Objectives of the study

1.3.1 General Objective
The general objective of this study is to examine the effect of e-banking services on performance of banks in Ethiopia.

1.3.2 Specific Objectives
The study pursued the following specific objectives;

1. To show the effect that ATM has on the performance of sample banks in Ethiopia.
2. To reveal the effect that POS has on the performance of sample banks in Ethiopia.
3. To examine the effect that Mobile Banking has on the performance of sample banks in Ethiopia.
4. To study the effect that Bank Size has on the performance of sample banks in Ethiopia.

1.4 Scope of the Study
Nine banks operating in Ethiopia were taken into consideration by the study. Banks that use electronic banking service since 2017 are the study's units of analysis. Automated teller machines, mobile banking, point-of-sale machines, and bank size were employed as the study's independent variables. The data was gathered over a five-year period from 2017 to 2021.

1.5 Limitation of the Study
The main problem was that it was difficult to gather data from the sampled banks. Because the chosen banks are reluctant, it was difficult to obtain specific data.

1.6 Significance of Study
The findings of this study could be valuable to the banks. The study may aid banks in better understanding how e-banking services affect their performance and using those services towards that end.

Future studies interested in e-banking services and their impact on bank performance could use the study as a reference. The study contributes to the body of knowledge and will be a useful resource for organizations, academics, business managers, and everyone interested in learning further about e-banking.

2. LITERATURE REVIEW
Several researches have studied the relative effectiveness of banks providing e-banking services; the most significant ones are covered below. Malhotra and Singh (2009) discovered that because Internet banks operate with lower operational costs than non-Internet banks, they are generally more lucrative than non-Internet banks. They came to the conclusion that Indian banks with an Internet presence produce more deposits or client accounts than banks without one.
The profiles of banks that offer Internet banking differ significantly in a number of ways, according to Malhotra and Singh's 2009 investigation. Internet banks have better asset quality and are efficiently run to reduce building and equipment costs.
Online and phone banking have been linked favorably to bank performance, according to Muiriuri (2014). According to the report, using internet banking increased accuracy and efficiency, giving them a competitive advantage over other banks.
When Arisa and Muturi (2015) looked into how Kenyan commercial banks performed financially, they discovered that electronic banking did contribute to those results. The study's respondents believed that mobile banking produces fresh financial breakthroughs.
In their study on the effects of electronic banking on a commercial bank's profitability, Karimzadeh et al. (2014) demonstrated that e banking has increased the bank's profitability. In other words, through increasing the number of ATMs, POSs, and terminal branches, clients' access to banking services has improved, as has their confidence in banks.

The study by Mutual (2010), on the other hand, found a weak positive statistically insignificant association between mobile banking and the financial success of Kenyan banks.

According to Wanja's (2014) research, there is a strong correlation between the financial performance of the banks and mobile banking. The survey found that bank income from online and mobile banking has increased significantly. Growing innovations and user use of mobile phones led to this spike in income from internet and mobile banking. Banks have a tremendous opportunity to improve performance and, as a result, shareholder returns by implementing innovations.

According to Oyewole et al. (2013), after two years of deployment, e-banking improves bank performance in terms of ROA and NIM, however the first year of adoption had a negative effect.

According to Osondu et al. (2013), there is a significant difference between pre- and post-adoption returns on equity for electronic banking. The outcome demonstrates that, solely in terms of returns on equity (ROE), e-banking has greatly improved the performance of Nigerian banks.

Wondwossen and Tsegai (2005) conducted research on Ethiopia's e-payments opportunities and difficulties. Therefore, the absence of payment laws and regulations, specifically for electronic payments, a lack of client confidence in the initiatives, a lack of competent labor, and frequent power outages are the biggest barriers to the growth of e-payments.

Gardachew (2010) examined the main obstacles and possibilities in e-banking. The difficulties include the inadequate financial networks connecting various banks, the absence of an appropriate legal and regulatory framework for e-commerce and e-payment, the underdeveloped telecommunications infrastructure, the high levels of illiteracy, the increased cost of internet, the lack of a dependable electricity supply, and cyber security concerns. The non-governmental organizations ECA and the World Bank have offered a lot of assistance in building national e-commerce plans, which is one of the opportunities that have been highlighted.

Debit cards have been shown by Tilahun (2016) to positively impact banks' profitability. By allowing customers to access their accounts whenever they choose, even after business hours, POS and debit cards enhance transactions. Additionally, it benefits the government by lowering the expensive printing of the traditional paper money. However, the study also shows that the profit margin of banks is negatively impacted by POS and ATM systems. The profitability would decline as the number of ATMs rose since people would only use them to withdraw cash. The installation costs for ATM terminals also have a negative impact on bank profits.

A study on the effects of ICT on the performance of the Ethiopian banking sector from 2010 to 2014 was undertaken by Girma (2016). The conclusion demonstrates that the POS and ATM in Ethiopian banks have no statistically significant impact on Return on Asset. Additionally, the results revealed that the number of branches and POS machines have a negative impact on Ethiopian banks' Return on Asset.

The two major IT-related investments in Ethiopian commercial banks, according to Dawit (2017), are in both software and hardware. These expenditures have a detrimental and statistically significant effect on the ROA of Ethiopian banks. According to the study's findings, the profitability indicators in the Ethiopian banking sector are not positively impacted by hardware investments made in ATM, mobile banking, POS, internet banking, etc.

3. RESEARCH METHODOLOGY

3.1. Research design

Examining how e-banking services affect private banks' performance in Ethiopia is the main goal of this study. A quantitative technique and an explanatory style of study design are utilized to achieve this goal. Explanatory research is defined by Saunders et al. (2009) as studies that establish causal associations between variables.

3.2. Population and Sample

Nine banks from among the total number of banks recognized by NBE were specifically chosen for the study and are listed below.

Table 3.1 List of banks selected for this research (Sample Banks)

S.No	Name of the Bank
1	Commercial Bank of Ethiopia
2	Awash International Bank
3	Dashen Bank
4	Bank of Abyssinia
5	Wegagen Bank
6	Nib International Bank
7	United Bank
8	Berhan International Bank
9	Zemen Bank

3.3. Data Collection

The research employed secondary data. The information that has previously been gathered from primary sources and made easily accessible for scholars to employ for their own research is called secondary data. The information was gathered from the National Bank of Ethiopia's yearly report, annual reports of banks, and published and unpublished reports obtained from the E-banking divisions of the banks used in the sample.

The data obtained covered the years 2017 to 2021. Examining numerous materials, including research articles, books, and scientific journals, resulted in the acquisition of additional data.

3.4 Data analysis

Inferential statistics were employed in the study to analyze the data. The software program E-views 9 was used for the analysis. The required information was initially cleaned and organized. The computer was then used to analyze the panel data that had been collected. Inferential regression analysis was done to examine the association between the various variables.

3.5 Analytical Model

The model was developed as follows

$$ROA = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

- dependent variable
    - Performance as measured by the ROA
- α_0 is the regression constant
- The independent variables
    - X1- NATM refers to Number of ATM terminals
    - X2- NPOS refers to Number of POS terminals
    - X3- NMBU refers to Number of Mobile banking users
- The control variable
    - BS refers to the Bank Size ε is the Error Term.

4. Analysis and Finding/Results

4.1 Model diagnostic tests

4.1.1 Multi-collinearity
The following table provides the output for the multicollinearity test

Table 4.2 Correlations among Independent Variables

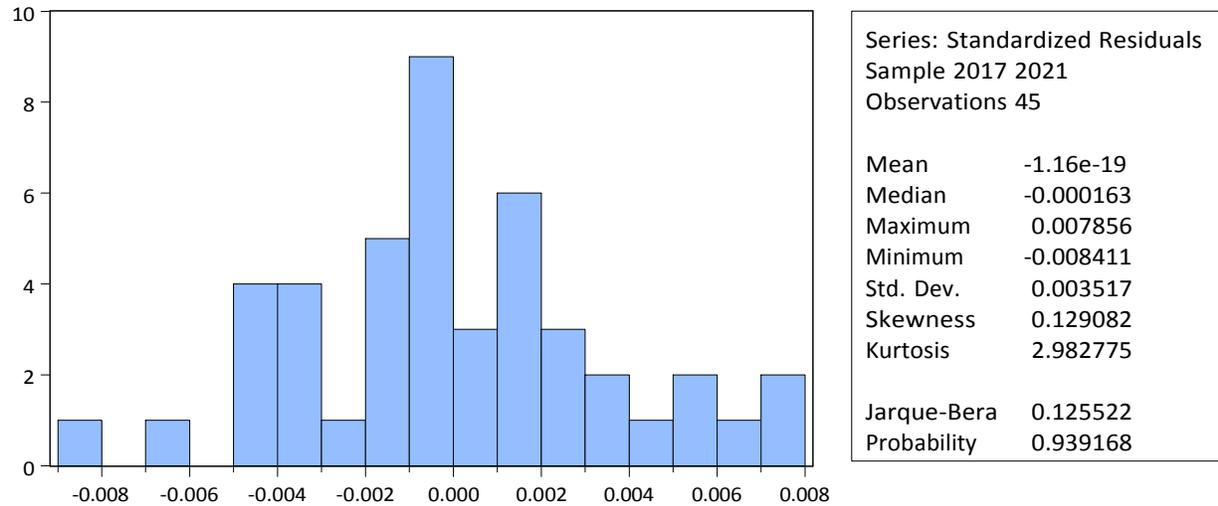|	BS	NATM	NMBU	NPOS
BS	1.000000	0.665425	0.799019	0.769409
NATM	0.665425	1.000000	0.678571	0.642096
NMBU	0.799019	0.678571	1.000000	0.797238
NPOS	0.769409	0.642096	0.797238	1.000000

Source: sample banks

According to the results shown in the table above, the highest correlation is 0.79. It may be concluded that there is no multicollinearity in this study because there is no correlation that is more than 0.8 (Brooks, 2014).

4.1.2 Normality

The distribution of the panel observation is symmetric around its mean, as can be seen in the graph in figure 4.1 below. The Jarque-Bera statistic test result has a P-value of 0.94, suggesting that the data was normal, as the p-value for the Jarque-Bera test is greater than 0.05.

Figure 4.1 Normality Test for Residuals

Series: Standardized Residuals
Sample 2017 2021
Observations 45
Mean   -1.16e-19
Median   -0.000163
Maximum   0.007856
Minimum   -0.008411
Std. Dev.   0.003517
Skewness   0.129082
Kurtosis   2.982775
Jarque-Bera   0.125522
Probability   0.939168

Source: sample banks and own computation

4.2 Random Vs Fixed Effect panel Models selection

To test whether to use random or fixed a Hausman test was done (Jeffrey, 2012). The following is the output

Table 4.3 Hausman Test

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	22.226430	4	0.0002

Source: own computation

The Hausman test P-value of a model is 0.0002, which is significantly lower than the 5% threshold for significance, as shown in Table 4.3. Fixed effect models are therefore more appropriate than random effect models.

4.3 Regression model output

The output of the model has been presented as follows.

Table 4.4 Fixed Effects Model Regression Results

Dependent Variable: ROA
Method: Panel Least Squares
Date: 20/07/22 Time: 14:41
Sample: 2017-2021
Periods included: 5
Cross-sections included: 9
Total panel (balanced) observations: 45

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.043463	0.002569	16.91587	0.0000
NATM	-9.17E-06	3.02E-06	-3.039434	0.0047
NPOS	-7.99E-07	8.43E-07	-0.947904	0.3503
NMBU	1.46E-08	6.82E-09	2.142843	0.0398
BS	-3.00E-05	1.32E-05	-2.276397	0.0297

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.684344	Mean dependent var	0.035244
Adjusted R-squared	0.565973	S.D. dependent var	0.006260
S.E. of regression	0.004124	Akaike info criterion	-7.907037
Sum squared resid	0.000544	Schwarz criterion	-7.385113
Log likelihood	190.9083	Hannan-Quinn criter.	7.712469
F-statistic	5.781347	Durbin-Watson stat	1.702779
Prob(F-statistic)	0.000034		

Source: E-views output

Results on Table 4.4 showed that the variables explain 68.4% variations of ROA of commercial banks in Ethiopia as represented by the R2; while additional factors outside the scope of the model account for the remaining 31.6% of ROA fluctuations.

According to Table 4.4's findings, the independent factors utilized to predict or influence the performance (return on assets) of the banks are statistically significant. According to the study, the variables had a statistically significant effect with a p-value of 0.000034 at a 1% level of significance. This demonstrates how important electronic banking services are in explaining or influencing the return on assets of Ethiopian banks.

4.4 Analysis and Findings of the study

According to the results of the regress**ion, the coefficient intercept** is 0.043463. This suggests that the average ROA would be 0.043 units and statistically significant at the 5% level of significance when all **variables** had a value of zero.

4.4.1 Relations between ATM and RoA

According to table 4.4's findings, the number of ATMs has a considerable negative impact on Ethiopian banks' return on assets (ROA), with a unit increase in the number of ATMs resulting in a 9.17-fold fall in ROA and vice versa. These results are consistent with the Tilahun (2016) study, which discovered that the number of ATM terminals has a negative influence on profitability. Gakure and Ngumi (2013) concluded that ATMs in Kenya helped banks make money, which is the opposite of what this study revealed.

4.4.2 Relations between PoS and RoA

The result in table 4.4 also demonstrates that other factors are constant and that the number of POSs in Ethiopia's commercial banks has a negative impact on ROA; as a result, an increase in POSs could lead in a ROA decline by a factor of 7.99. Additionally, at a 5% level of significance, the number of POS has little bearing on how the ROA is explained. The results support those of an earlier study by Girma (2016), which found that POS had a negligible impact on the return on assets for commercial banks in Ethiopia.

The study by Gakure and Ngumi (2013), in contrary to this finding, came to the conclusion that POS terminals have such a favorable impact on banks' income.

4.4.3 Relations between the MB Users and RoA

The results shown in table 4.4 shows that the number of mobile banking users has a favorable and significant impact on the ROA of Ethiopia's commercial banks when other predictor variables stay constant. This suggests that a unit increase in mobile banking users would result in a factor enhancement in ROA of 1.46. The results are consistent with those of Munyok (2015), who discovered that mobile banking had greatly enhanced bank profitability. According to research, banks' M-banking solutions have greatly improved their revenue over the past five years.

Additionally, Arisa and Muturi (2015) found that the use of mobile banking enhances profitability. According to the findings, mobile banking offers banks a great chance to introduce new financial innovations, improve the ease of services for current clients, enable clients to check their bank balances, carry out necessary electronic payments, as well as provide information on client transactions.

4.4.4 Relations between Bank Asset Size and RoA

Table 4.4 demonstrates that while other explanatory variables are constant, the ROA of commercial banks in Ethiopia is significantly impacted negatively by bank size. This indicates that a unit increase in the bank's size results in a three-fold reduction in ROA.

Expanding the size of a bank has had a favorable and significant effect on profitability, which is in contrast to the findings of Karimzadeha et al. (2014) who investigated the impacts of e - banking services on bank profitability.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The regression analysis reveals a negatively statistically significant correlation between ATMs and profit of banks. The study also showed that the number of POS has a bad impact on Ethiopian banks' ROA. The poor outcome might have resulted from factors such as the high cost of electronic banking services, recurrent power outages, limited internet penetration, and low computer illiteracy rate.

However, the study found a statistically significant positive correlation between ROA and the number of customers of mobile banking.

Since mobile banking offers banks a cheap and accessible alternative to traditional service delivery models, it has a favorable impact on ROA (low cost both to the actual consumers and the bank). Additionally, the study discovered that bank size had a statistically significant detrimental impact on ROA. A vast branch network was once a competitive edge, and now it could be a competitive disadvantage, according to the study.

5.2 Recommendations

- It is advised that in order to enhance the acceptance and usage of e-banking services, the authorities assist and collaborate with commercial banks.
- To enhance and broaden e-banking services in Ethiopia, the National Bank of Ethiopia, commercial and public banks, and technology providers should collaborate and develop partnerships.
- The bank's management should devote time, energy, and finances to e-banking services and investigate how e-banking might enhance bank performance.
- Banks should concentrate their efforts on fostering consumer trust in e-banking services and creating marketing strategies that motivate users of these services.
- The bank's senior management should occasionally instruct consumers on electronic banking, including its advantages, risk exposure, and physical and digital security.
- Short-term training sessions for bank employees are needed to familiarize them with current advancements in sophisticated technology.
- The banks must be focused on their objectives and employ the appropriate technology to accomplish their goals, instead of obtaining online banking technology simply because other banks do.

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