DOI: https://doi.org/10.53555/nnbma.v7i10.1074 Publication URL: https://nnpub.org/index.php/BMA/article/view/1074

ELECTRONIC BANKING TOOLS AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKING IN RWANDA A CASE STUDY OF BANK OF KIGALI

PATRICK SHYAKA[1*] SHYAKAP@GMAIL.COM, DR. PAUL MUNENE[2] MUNENEPAUL1@GMAIL.COM[2],

*[1] School of Social Sciences, **Finance and Accounting**, Mount Kenya University, Kigali, Rwanda,*
[2]Senior Lecturer, Mount Kenya University, Kigali, Rwanda

Corresponding Author: -
shyakap@gmail.com

Abstract

The purpose of this study was to analyze the contribution of e-banking tools on financial performance of commercial banks in Rwanda. Specifically, the study verified the contribution of ATMs use, mobile banking, and internet banking, and established the extent of contribution and link between those variables namely ATMs, mobile banking and internet banking on financial performance of Bank of Kigali. Descriptive survey design and correlational design were adopted. Fifty-two staff members from Bank of Kigali were the target population of Bank of Kigali. The information utilized in this research was quantitative in nature. Also, secondary information namely annual publications from 2016 to 2020 (5 years) were collected from Bank of Kigali. This included balance sheet, income statements and executives' reports. Regression analysis was employed to examine the link between e-banking tools and performance of Bank of Kigali. To gather info, a form survey and interviews were adopted and SPSS 22 version supported in data analysis process. All ethical issues were considered. Through ought the data, it was concluded that many of participants agreed that ATMs contributed a lot on financial performance of BK; this was indicated by the overall mean of 4.612 and a Std.Dev of 0.4882. Majority also agreed that mobile banking contributed to financial performance of BK, evidenced by mean of 4.556 and Std.Dev. of 0.481. To the same extent the study also revealed that internet banking contributed to financial performance of BK, and this was evidenced by the overall mean of 4.610 and a standard deviation of 0.481. Looking at correlation, the study reported a positive degree of relationship between E-banking tools and financial performance at BK as indicated by the following ratios; 0.700, 1 and 0.422 for ATMs, mobile banking and internet banking respectively. Finally, the regression model of the study was $Y: 4.321+0.667X^1 + 0.308X^2 + 0.213X^3$. *In conclusion, these findings proved that e-banking tools contributed a lot to financial performance of Bank of Kigali, and in these recent years the use of e-banking tools in providing financial services have significantly increased meaning the revenues from the use of these tools also increased as shown by positive correlation within key variables under investigation. The researcher recommends Bank of Kigali and other financial institutions to put in place sustainable measures and infrastructures to maintain and improve the use of e-banking tools as they are great sources of income.*

Keywords: *Electronic banking tools, Financial performance, Commercial banks, Bank of Kigali, Rwanda*

1. INTRODUCTION

In Rwanda, the National Bank of Rwanda (BNR, 2019) revealed that in period between the year 2016- 2019, ATM transactions increased by 32% (from 7.3M to 9.7M in 2019), POS transactions increased 955% (from 0.21M to 2.2M in 2019), mobile financial transactions increased by 135% (from 142M to 333M in 2019) and internet banking transactions increased by 201% (from 0.3M to 1.8M in 2019). This increase of e-banking tools usage is very significant leaving the researcher willing to understand what's behind the considerable rise of these digital platforms and how do they contribute to the performance of commercial banks to the extent that these banks have and are willing to heavily invest in them.

Another reason that pushed the researcher to do this study is that previous researches related to the study under investigation did not examine the contribution of different e-banking services offered on the market all of them in one research study instead available researches looked at one single e-banking tool and the researcher believes it will have more weight and will give a bigger picture on the contribution of e-banking tools on performance of financial institutions if studied all together in one research study and the ones that does are old or have not been conducted vis a vis with the Rwandan banking industry. For instance, Mukamana (2019) examined the impacts of ATMs on financial performance of commercial banks in Rwanda, while Harelimana (2017) examined the impact of mobile banking on the financial performance of Unguka Bank, both studies concentrated on only one e-banking tool. Also, Al-Smadi (2011) investigated the impact of e-banking on performance of Jordanian banks, leaving a curiosity to have such study with the Rwandan industry as focus thus a need for this study. So, this study investigated the contribution of E-banking tools on financial performance on banks in Rwanda taking Bank of Kigali as a case study.

1.1 Objectives of the study

1.1.1 General objective

The main purpose of the study was to determine the contribution of E-banking tools on financial performance of commercial banks in Rwanda.

1.1.2 Specific objectives

(i) To determine the contribution of ATM cards on financial performance of Bank of Kigali.
(ii) To determine the contribution of mobile banking on financial performance of Bank of Kigali.
(iii) To determine the contribution of internet banking on financial performance of Bank of Kigali.

2. Review of Literature

2.1 ATM and Financial Performance

The previous studies conducted in this field of ATM and financial performance like the study of Mwatsika (2016), revealed that 353 respondents took part in his research, with the aim to evaluate the increase of the number of ATMs and the influence it had on bank customers. The focus of this study was on the performance strategy and client satisfaction. The data was analyzed using SPSS and a dimension and multiple characteristics closed ended questionnaire. Respondents assessed just banking performance and ATM usage enjoyment. According to a regression model of ATM banking performance and customer satisfaction, ATM banking performance contributes 40% to customer satisfaction within the bank, but ATM banking was not enough to entice people to switch banks.

The opposite view was found in the Nigerian study by Jegede (2014), with the aim to study the contribution of ATMs to the performance of Nigerian banks. This research was motivated by the astronomical challenges faced by the increased number of ATM infrastructure and the associated financial losses. In addition, there has been a serious debate about the relevance of ATM technology as most countries in the world move from virus technology to more secure smart cards that are credit and debit fraud-free. Information from a suitable sample of 125Employees from 5 designated banks in Lagos. SPSS and Chi-Squire technology were adopted to examine collected information. Findings indicated that the use of ATM terminals less than the benefits has, on average, enhanced the growth of Nigerian banks due to the high level of ATM fraud and that the quality service of ATMs is slightly correlated to the safety and confidentiality of users.

To make local studies a case, reference was made to the study carried out by Mukamunana (2019). The study was titled Impact of ATMs on the Financial Performance of Commercial Banks in Rwanda; Bank of Kigali was the case of study. Data from primary and secondary sources were processed and analyzed with SPSS, logistic analysis was adopted to evaluate as well as deduce binary logistics, it was also used to analyze logistic analysis, 84 percent of respondents agreed that ATMs in Rwanda have an influence on financial performance of banks and the calculated hypothesis concluded that there was a significant association between transactions made with Automated Teller Machine and the growth of the Bank of Kigali.

To the same degree, Harelimana (2018) examined the impact of Automated Teller machines (ATM) and the profitability of the commercial bank (2010-2016). The research aimed at examining ATMs usage and their contribution to Bank of Kigali profitability. Data collection methods like quantitative and qualitative were utilized in order to obtain primary data, including questionnaires. At BK, a survey of 200 respondents was taken from a total population of 334,121 ATM users. The findings revealed that Bank of Kigali continues to face a challenge in terms of customer financial education (information, training, etc.) on the most proficient method to utilize ATM cards. The Bank of Kigali's benefit remained immaculate, with ROA, ROE, and net profit of 4.0 percent, 22.9 percent, and 9.9 percent, respectively, in 2014; 4.0 percent, 22.2 percent, and 11.1 percent, respectively, in 2013. Finally, according to the investigated assumptions, there is a strong link between ATMs and Bank of Kigali financial production.

2.2 Mobile Banking and Financial Performance

The previous studies conducted in the field of mobile banking and financial performance like the study conducted on mobile banking and economic growth by Tellez and Donner (2008), with the goal of establishing a connection between adoption, effects, and use of mobile banking usage, concluded that it is used a method to lower the expenses of transferring cash from one location to another, as well as a way to bring more consumers into connection with formal structured economic systems, also it can become a necessary innovation for the modern world of technology. But, the true essence of that importance needed multiple studies as well as numerous procedures and multiple theoretic views before responding to queries about approval and influence.

Macharia (2016) performed research into the effects of increased cell phone usage on the Kenyan commercial banking business. Descriptive design was used for this research and forty-five commercial banks were the target population and that majority of commercial banks were offering mobile banking services. The study concluded that banking services on cell phones were offered by most financial institutions and that those services offered were mainly related to account information and request and maintaining an excellent customer service with their customers and this benefited a lot the banking industry in Kenya. Therefore, the executive management of banks must have a bigger picture regarding technology, price and market share strategies to maximize financial and technological opportunities within the industry.

Kiprop (2018) investigated the effects of mobile money services on financial firms' profitability in Kapsabet Town. The target populations were bank employees and customers from Kapsabet Town including senior management executives, head of different departments and other bank staffs. The descriptive design was used for selected commercial banks and primary data were collected using interviews and questionnaires. Statistics and calculations were carried out with the help of SPSS. The findings revealed a strong link between mobile money services and private bank effectiveness. The conclusion of the research was that financial transactions using mobile phone eased fund transfers to recipients and also guaranteed easier monitoring tracking and monitoring of creditors. The researcher also added that mobile banking can save time, can ensure easy bill payments and avoid cash payments, thereby ensuring fast remittances and finally payments to mobile bank accounts can positively affect bank performance area.

Last but not the least, Harelimana (2017), analyzed the contributions of mobile banking on the financial performance of Unguka Bank Ltd in Rwanda. The time scope of the study was from the year 2012 to 2016. A detailed analysis of prior research the impact of m- banking on the growth of Unguka Bank Ltd. Qualitative and quantitative methods like interviews and questionnaires were adopted to obtain raw data. Second data were also collected to achieve the research purposes. Questionnaires were shared with bank senior management as well as staffs with mobile banking usage experience while interviews have been conducted with managers to fully understand the research topic and correct any deficiencies in the questionnaire. The findings indicated positive correlation between mobile banking and financial growth of Unguka Bank Ltd, though more efforts are needed to extend the scope.

2.3 Internet Banking and Financial Performance

The previous studies conducted on internet banking and financial performance such as the study carried out in India by Kapadia and Vaghela (2018), concentrated on the impact of internet banking on the financial performance of a few Indian financial institutions. The goal of the study was to determine the influence of certain investment banks' internet banking services on their profitability, which was measured in terms of both ROE and ROA. This study concluded that internet banking influence growth of commercial bank in India. The same results were found in the study carried out by Tunaya (2015) in euro countries, which examined the interaction between internet banking and banking performance. The findings revealed a substantial link between internet banking and bank financial success in Euro countries, with financial performance being measured by return on equity (ROE) and return on assets in this study (ROA). Furthermore, study conducted by Al-Smadi (2011) in Jordan indicated the opposite view. The study looked at the impact of electronic banking (including online banking) on the financial performance of Jordanian commercial banks from 2000 to 2010. The panel data consisted of 15 banks in Jordan. Electronic banking has a significant negative impact on commercial bank performance in Jordan, according to the findings.

The goal of Okiro and Ndungu's (2013) study was to see how online banking affected financial institutions in Nairobi, Kenya. Thirty financial organizations were analyzed, and the findings revealed that commercial banks and internet banking had a significant association. According to the report, the most popular service utilized by internet banking customers is account balance checking, while the least popular option is bill paying.

Hugo (2013) found that internet banking contributed significantly to the financial productivity of Kenyan commercial banks in his research which was focusing on the diversification of income sources and financial productivity of Kenyan commercial banks between 2007 and 2011.The study revealed also that commercial banks in Kenya benefited hugely from the diversification of sources of income, internet banking incomes included and that without this income diversification most banks would have problems achieving their financial and shareholders wealth targets and in some cases leading to bankruptcy.

3. Materials and Methods

Referring to the nature of this research, descriptive survey design was suitable. According to Sanders (2013), the descriptive research used for this research study provides precise descriptions of people, events or situations. This case study has a target population of 52 personnel of BK headquarters; e-banking, finance, audit as well as information technology departments. The researcher applied census method for this study meaning all population was involved in the study. This was based on the recommendation given by Mugenda and Mugenda (2008) that for any population less than 100, researcher should use whole population in order to maintained credibility and reliability of collected data.

Interviews and questionnaires provided primary data for this study, while secondary data was gathered from BK's yearly financial releases from 2016 to 2020. In addition, various publications from the National Bank of Rwanda (BNR) and the National Institute of Statistics in Rwanda (NISR) were used to gather data primarily on e-banking tools and commercial bank financial performance in Rwanda. The data gathered for this study was quantitative in nature. The researcher gathered, tallied, summarized and conducted the appropriate analysis

The SPSS 22 version was used to analyze information gathered from the research. The data that was coded, modified, and tallied was numerical. The frequencies, percentages, mean, and standard deviation were calculated using the descriptive technique. Inferential statistics (linear regression analysis) were used to investigate how e-banking tools influenced Bank of Kigali's financial performance, while correlation was used to create a link between variables. Taking into consideration regression equation: $Y1= ß_0 + ßx_{1,} + ßx_{2\,+} ßx_3 +\sum$. Where, Y1= Financial performance at bank of Kigali. X1= ATMs; X2= Mobile banking; X3= Internet banking, &= margin of error. All of this was done in order to make the facts transparent and understandable to everyone. Techniques of qualitative research were employed. Some statistics are supplemented by qualitative research methods, mostly from secondary data gathered by documentary analysis. This investigation includes several figures derived from the primary data.

4. Research Findings

4.3.1 Contribution of ATM Cards on financial performance of Bank of Kigali

This objective looked at how the bank of Kigali used Automated Teller Machines and how they affected the company's financial results. Collected data were analyzed through descriptive (mean, frequency, and percentages), correlational and regression analysis using SPSS 24th Version and the findings were presented in the tables. Questions organized in Likert scale format were administrated to the respondents and the given answers were summarized in the table 4.5.

Table 4.1 contribution of ATMs on financial performance at BK

STATEMENTS	Disagree		Neutral		Agree		Strongly Agree		n	Mean	Std. Dev
	F	%	F	%	F	%	F	%			
BK customers using ATM increase day to day, this improves financial performance	0	00	0	00	27	51.9	25	48.1	52	4.48	.480
Accessibility of BK ATMs in every place of the country improve financial performance of the bank.	5	9.6	7	13.5	19	36.5	21	40.4	52	4.67	.504
Facilities given to ATM users at BK increased the number of users this helps to improve the performance of BK.	0	00	0	00	17	32.7	35	67.3	52	4.71	.504
Availability of BK ATMs 24/7 helps to improve financial performance of the bank.	2	3.8	8	15.4	11	21.2	31	59.6	52	4.63	.473
Technology used by BK ATMs satisfy customers expectations this helps to improve financial performance	6	11.5	5	9.6	27	51.9	14	26.9	52	4.57	.480
Overall Average	**3**	**5.7**	**4**	**7.7**	**20**	**38.5**	**25**	**48.1**	**52**	**4.612**	**.4882**

Source: Primary data, 2021

Table 4.5 shows responses given by respondents showing the influence ATMs have on financial performance of Bank of Kigali. Analysis and presentation have been summarized from responses of respondents. Majority of the respondents at 51.9% whose mean was 4.48, agreed that BK customers using ATM increases on daily basis, thus leading to the improve of financial performance on the first statement; on the second statement majority of the respondents at 40.4% with mean of 4.67 strongly agreed that accessibility of BK ATMs in every place of the country would contribute to the productivity of BK; on third statement respondents at 67.3% with mean of 4.71, strongly agreed that facilities given to ATM users at BK increased the number of ATM users this helps to improve the financial performance of BK; on the fourth statement, majority of the respondents at 59.6% with mean of 4.62 strongly agreed that availability of BK ATMs 24hours within 7 days helps contribute to BK financial performance; on fifth statement, respondents at 51.9% with the mean of 4.57 agreed that technology used by BK ATMs satisfy customers expectations this helps to improve financial performance. Majority of respondents strongly agreed that ATM use at BK contributed a lot on financial performance. This was indicated by the overall mean of 4.612 with a standard deviation of 0.4882. These findings resembled with the findings conducted by Mwatsiko (2016), the findings revealed that ATM banking services explained 40 percent on customer satisfaction in Zambia.

A simple inferential statistic was done to investigate the correlation between ATMs and financial performance (Return on equity, and return on Asset).

Table 4.2 Correlation analysis between ATMs and Financial Performance of BK

		Financial Performance at BK
ATMs	Pearson correlation	.700**
	Sig (2-tailed)	.00
	N	52

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Primary data 2021 (Source)

The above table (4.6) shows a strong positive relationship between Automated Teller machine use and financial performance at BK, where (r=.700), (p=.000), and (N=52). The relationship shows that when the number of ATM users increases, the charges and fees of related transactions increases therefore contributing to the financial performance of BK. These findings coincided with results of the research by Abuya and Niyosenga (2017) on quality service systems and financial performance of financial institutions. Its results affirmed a positive correlation between the two variables. The Regression analysis was done to produce a model summary, analysis of variance and coefficient of determination.

Table 4.3 Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.402[a]	.162	.142	.75593

a. Predictors: (Constant), ATMs of BK are available in every place of the country; this contributes to the financial performance.

Source: Primary Data, 2021

Table 4.7 present model summary findings. It shows R= 0.402; R Square equal to 0.162; adjusted R Squire equal to 0.142, and standard error of estimation was 0.7559. The R, squire also known as coefficient of determination was 0.162. This means that ATMs can explain 16.2 percent on the performance of Bank of Kigali. This implies that the change on independent variable has considerable impacts on BK's productivity. The results were against the ones presented by Jugede (2014) in Nigeria who concluded that ATM use does not improve financial performance because it is associated with high fraud leading to financial losses. And that ATM fraud and the quality of ATM service are less related to the safety and privacy of users.

Table 4.8 Variance analysis

ANOVA[a]

Model		Sum of Squares	DF	Mean Square	F	Sig.
1	Regression	4.636	1	4.636	8.114	.007[b]
	Residual	24.000	51	.571		
	Total	28.636	52			

a. Dependent Variable: Financial Performance

b. Predictors: (Constant), ATM

Source: Primary Data, 2021.

Significance of the regression model was tested using Analysis of variance (ANOVA). The Table 4.8 shows that regression model was significant at (p = .007). This means that correlation and significance has not happened hazard by as the .007 is lesser than 0.05 which makes the regression findings reliable and credible.

Table 4.4Analysis of Regression Coefficient

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.667	1.033		.645	.522
	ATM	.667	.234	.402	2.848	.007

a. Dependent variable: Financial performance

Source: Primary data 2021

As per the above table (4.9), regression coefficient of ATMs is statistically significant in explaining financial productivity at BK. As per summarized the ATM usage is statistically significant to impact the financial performance of

BK (B = .667), (P=0.007). Increase in Automatic Teller Machine usage by one unit leads to the improved 0.667 unit on the financial performance of BK. This study supports previous research that found a robust link between ATM usage and commercial bank financial productivity in Kenya (Kamau, 2013). Content analysis from the interview held with a staff in charge of electronic banking services revealed that "*for the case of features of e-banking we have adopted here, we can confess that automatic teller machine, visa credit cards, mobile banking, money transfer and accessibility to bank account via electronic devices were frequently used in our bank*". With the same views, De Young (2015) observed that the different business people, accountants and other approved workers may access recurring banking services; fund transfer, deposits and other services through electronic banking portals. The researcher was made to understand that financial institutions have a multitude of products electronic banking that have eased banking activities leading to improved bank performance.

1.0. 4.3.2 Contribution of mobile Banking on financial performance of Bank of Kigali

The second objective that this study aimed to achieve was to assess the contribution of mobile banking services on financial performance of Bank of Kigali in Rwanda. To achieve this, questionnaires were administrated to 52 respondents, after the analysis the data were presented in tables. While data collected from interview were presented in the textual model.

There was a need to assess the extent to which respondents understand the role of mobile banking on financial performance of commercial banks in Rwanda more specifically Bank of Kigali. To achieve this, the data was collected, after the analysis the data was presented below.

Table 4.5 Contribution of Mobile Banking on Financial Performance at BK

STATEMENTS	Disagree		Neutral		Agree		Strongly Agree		n	Mean	Std.Dev
	F	%	F	%	F	%	F	%			
Increase in the number of mobile banking users improves financial performance at BK.	0	00	8	15.4	26	50	18	34.6	52	4.19	.480
BK customers are able to communicate with bank managers through phone calls or SMS this improves collaboration leading to financial performance.	0	00	0	00	27	51.9	25	48.1	52	4.88	.504
Financial services offered to customers of BK through mobile influence the financial performance of the Bank.	3	5.7	0	00	25	48.1	24	46.2	52	4.48	.473
Availability of mobile banking services any time anywhere, improves the performance of BK.	0	00	0	00	18	34.6	34	65.4	52	4.58	.480
Accessibility of mobile banking services to all customers improves the performance.	4	7.92	2	3.9	16	30.9	30	57.7	52	4.65	.468
Overall Average	**1**	**1.9**	**2**	**3.8**	**23**	**44.3**	**26**	**50**	**52**	**4.556**	**.481**

Primary data 2021 (Source)

As per the table (4.10), it is shown that mobile banking contributed to the financial performance of BK. Analysis and presentation were analyzed per statements. Looking at the first statement, majority of the respondents at 50% with Mean of 4.19 agreed that increase in the number of mobile banking users improved financial performance at BK, on the second statement many of the participants at 51.9% agreed, 48.1% strongly agreed that BK customers are able to communicate with bank managers through phone calls or SMS this improves collaboration leading to financial performance of the bank as indicated by the mean of 4.88, on the third statement, majority of the participants 48.1% agreed while 46.2% strongly agreed that financial services offered to customers of BK through mobiles contributed to the productivity of BK as indicates the mean of 4.48. On the fourth statement, 65.4% of respondent strongly agreed that availability of mobile banking services any time anywhere, improves the productivity of BK as shown by the mean 4.48. Last, but not the least, the findings on fifth statement shows that majority of the respondents at 57.7% strongly agreed that accessibility of mobile banking services to all customers stimulate financial performance of BK as indicated by the mean of 4.65. the overall mean was 4.556 and the standard deviation of 0.481, this confirmed the great contribution of mobile banking on productivity of BK. This concurs with the study by Donner and Teller (2008) who concluded that mobile banking stimulates financial growth which leads to economic development.

The inferential statistics was computed to establish relationship between mobile banking and financial productivity of the bank of Kigali. The computed findings were summarized below.

Table 4.6 Correlation Analysis between Mobile banking and financial performance of BK.

		Financial Performance
Mobile Banking	Pearson Correlation	1.00
	Sig. (2-tailed)	.000
	N	52

**Correlation is significant at 0.01 levels (2-tailed)
*Correlation is significant at 0.05 levels (2-tailed)

Primary data 2021 (Source)

As per above table (4.11), there was a perfect correlation between the two variables. The increase in number of mobile banking users will contribute a lot to the financial performance of BK; (r=1.00), (p=.000), (n=52). The findings concur with the research by Macharia (2009) which concluded that the use of mobile banking help to maintain a high-quality service availed to bank clients and this contributes to financial performance of Kenyan commercial banks.
Regression model was also computed and presented on below table.

Table 4.7 Model Summary

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.640[a]	.41	.18	.74863

a. Predictors: (Constant), Mobile Banking

Source: Primary data, 2021

Table 4.13 presents the model summary, showing how mobile banking usage contributes to financial performance of BK. The table shows r= .640; R-Square of .41; and the adjusted R square is. 18, while the SE: .74863. The coefficient of determination also known as r squire was 0.41. This indicated that mobile banking can explain 41 percent on the variation of financial performance at the Bank of Kigali.

Table 4.8 Analysis of Variance

ANOVA						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	1.007	1	1.007	1.797	.018[b]
	Residual	23.538	51	.560		
	Total	24.545	52			

a. Dependent Variable: Financial Performance
b. Predictors: (Constant), Mobile Banking

Source: Primary Data, 2021

Table 4.13 presented computed significance of regression model on the mobile banking and financial performance variables, as tested using analysis of Variance. The computed results shows that regression model is significant (p= .018). This means that correlation and significant has not happened by chance, this is true due to the fact that 0.018 is less than 0.05. This implies the reliability and credibility of the regression and correlation.

Table 4.9 Analysis of Regression coefficient

Coefficients						
Model		**Unstandardized Coefficients**		**Stand Coefficients**	**T**	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	4.231	1.060		3.992	.000
	Mobile Banking	.308	.230	.203	1.340	.187

a. Dependent variable; Financial performance

Source: Primary data 2021

As per the table (4.14), the regression coefficient of mobile banking is statistically significant in explaining how it contributes to financial performance of BK; (B = 4.231; P = .000). This implies that, 4.231 unit increases on financial performance of BK when there is an increase of one unit on mobile banking users. These results were not far from the findings presented by Kiprop (2018) where the findings from content analysis with the interview given to mobile operation manager *"number of customer register for mobile banking increase day to day. This also increase the transaction made through mobile banking hence financial performance being improved"*. The research results also concur with the ones of a study in Unguka bank Ltd, which revealed a strong positive correlation between the two variables under study though the scope was still very low for the latter. This confirms that mobile banking contributes a lot to financial performance of BK.

2.0. 4.3.3 Contribution of internet banking on financial performance of Bank of Kigali

The third objective of the study aimed to determine the contribution of internet on financial productivity of BK. To achieve this objective, questions in Likert scares format were administered to 52 respondents. After data collection and analysis, the data were summarized.

Table 4.10 Contribution of internet Banking on Financial Performance

STATEMENTS	Disagree		Neutral		Agree		Strongly Agree		n	mean	Std.Dev
	F	%	F	%	F	%	F	%			
Introduction of internet banking at BK have helped to improve quality of the services offered. This leads to the improves of financial performance at BK.	0	00	0	00	27	51.9	25	48.1	52	4.67	.473
Internet banking allows BK employees to access their bank account wherever they are.	0	00	0	00	17	32.7	35	67.3	52	4.70	.504
With the support of BK APPs all services given by BK are available on internet, this improves the financial performance of BK.	1	1.9	7	13.5	20	38.7	24	46.2	52	4.50	.466
Continuous control and security of internet banking systems at BK, improves customers trust to the bank.	0	00	0	00	18	34.6	34	65.4	52	4.69	.473
Introduction of internet banking at BK have helped the bank to reduce human personnel while improving quality of the services. This improves the financial performance of BK.	3	5.7	5	9.6	26	50	18	30.7	52	4.51	.492
Average	**1**	**1.9**	**2**	**3.8**	**22**	**42.3**	**27**	**52**	**52**	**4.61**	**.481**

Source: Primary data, 2021

As per the table (4.15), findings show how internet banking contributes on financial performance of Bank of Kigali. Findings were presented statement and the analysis followed the provided statement. Making the first statement a case, majority of the respondent 51.9% agreed and 48.1% strongly agreed that introduction of internet banking at BK have helped to improve quality of the services offered which leads to the improvement of financial performance at BK as indicated by mean of 4.67; the second statement follow, the findings indicated that respondents at 32.7% (agreed) and 67.30% (strongly agreed) that internet banking facilitates BK clients to have access to their bank account wherever they are, and this confirm the contribution of internet banking to financial productivity of BK as indicates the mean of 4.70; on the third statement majority of the respondents 38.7% agreed and 46.2% strongly agreed that with the support of BK APPs all services given by BK are available on internet, and this contributed a lot on financial performance of BK as indicated by the mean of 4.50; on the fourth statement, the majority of the responses shows that 34.6% agree and 65.4% strongly agreed that continuous control and security of internet banking systems at BK, improves customers trust to the bank, hence financial performance of the bank being improved as indicated by the mean 4.69. Last but not least, the fifth statement shows that 50% agreed and 30.7% strongly agreed that introduction of internet banking at BK has helped the bank to reduce human personnel while improving quality of the services. Majority of respondents strongly agreed that the internet banking contributed a lot to the financial performance of BK, explained by the overall mean of 4.610 and a standard deviation of 0.481. The findings presented in the above statement didn't go far from the findings presented by Kapadia and Vaghela (2018) in India which concluded that internet banking influence financial performance of commercial bank in India.

The association between online banking and BK's financial production was also investigated using the correlational coefficient, and the results were described below.

Table 4.16. Correlation analysis of Internet banking and financial performance

		financial performance of BK
internet banking	pearson correlation	.422
	Sig. (2-tailed)	.004
	N	44

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Primary data 2021 (Source)

The above table (4.16), shows a low positive correlation of internet banking and financial performance of BK; (r= .422); p= .004), (N= 44). The increase of customers who use internet banking at bank of Kigali, will also improve the financial performance. This concurs with the researches by Al-Smadi (2011) and Tunaya (2015) who concluded that internet banking is positively corelated with financial performance. The regression model was also computed reference, table 4.17.

Table 4.11 Model summary

model summary				
Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.678[a]	.46	.26	.46735

a. Predictors: (Constant), Internet Banking

Source: Primary Data, 2021

Table 4.17 present the model summary. It shows R= .678, R squire of .46; adjust r squire of .26 and SE= .46735. It also shows coefficient of determination known as r squire equal to 0.46. This tells us that the impact of internet banking explains 46 percent on the financial performance BK. Similar researches were established in the findings presented by Okiro and Ndungu, (2013), who revealed that internet banking has significant contribution on financial performance.

Table 4.12 Analysis of Variance

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	.521	1	.521	2.387	.029[b]
	Residual	10.921	51	.218		
	Total	11.442	52			

a. Dependent Variable: Financial Performance

b. Predictors: (Constant), Internet Banking

Source: Primary Data, 2021

Table 4.18 shows that regression model for this study is statistically significant. This was indicated by (p value = 0.029) lesser than 0.05. This explains the credibility and reliability of the correlation and significant and that it has not happened by chance.

Table 4.13 Analysis of Regression Coefficient

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	3.676	.649		5.665	.000
	Internet Banking	.213	.138	.213	1.545	.129

a. Dependent variable; Financial performance

Source: Primary data, 2021

The above table (4.19), shows how regression coefficient of internet banking is statistically significant in explaining the financial performance of Bank of Kigali; (B= 3.676; P = .000). One unit increase on internet banking users at Bank of Kigali, increases 3.676 units on its financial performance. An interview was held with an IT personnel in BK and declared "what *I can ensure you is that we have had adequate services in all parameters and we are happy, but we are struggling for distributing internet banking in all district and sectors where our branches are located*". The researcher concluded that electronic banking in the bank is described by respondents as good due to the benefits it has in facilitating customer and as far as success is concerned. Therefore, electronic banking ease and facilitation bring satisfaction to customers and bank officials, therefore stimulating the improvement of bank performance. The study findings are relevant since, e-fund transfer, account to account transfer, online payment of bills, online statement; credit cards were given by banking institutions (Awuondo, 2016). It was concluded that the e banking in the Bank of Kigali, further facilitated the easy and avoidance of time wastages while improving the banking activities including cross border banking being made easy. The bank has taken advantages of all these aspects and used them in improving its performance.

Table 4.20 Summary of Hypothesis Tested Results

Hypotheses Tested	Beta (ß)	P Value	Choice	R^2
Ho1: There is no significant contribution of ATMs use on Financial Performance at BK.	.667	.007	Rejected	.162
Ho2: There is no significant contribution of mobile banking on financial performance at BK.	.308	.008	Rejected	.410
Ho3: There is no significant contribution of internet banking on financial performance at BK.	.213	.000	Rejected	.460

Source: Primary data, 2021

Table 4.20 shows hypothesis tested and decision taken after conclusion. The tested hypothesis significance was lesser than .05 or P<.05. Based on the set rule that for every variable whose significance level is lesser than 0.05 reject null hypothesis, from the computed hypothesis the researcher had adequate confirmation to accept the alternative hypothesis and reject the null hypothesis. The researcher concluded that ATMs, mobile banking and internet banking significantly contribute to the financial performance of Bank of Kigali. Furthermore, the regression equation was concluded as follow: Y: 4.321 + $0.667X^1$ + $0.308X^2$ +$0.213X^3$ Whereas, Y= financial performance of bank of Kigali, X1= contribution of ATM, X2= Contribution of mobile banking, X3 contribution of internet banking.

3.0. 4.4 Bank of Kigali financial performance

Below tables illustrate different parameters and ratios that shows how Bank of Kigali has been performing from 2016 to 2020.

Table 4.21 Market Share at Bank of Kigali

	2016	2017	2018	2019	2020
Market share (%)	26.8	27.1	28.4	29.3	30.3

Source: BK Investor presentation (2021)

According to secondary data from Bank of Kigali, the researcher found out that the market share for Bank of Kigali has been on the rise in the recent year going from 26.8% in 2016 to 30.3% in 2020 showing how the Bank has been growing. The more customer base the bank has, the more transactions done, the more income generated from those transactions and therefore the more profitable the company should be. Also this market share is a good indicator of how many users of e-banking tools BK can digitally serve or even how to allocate those tools for better serving its customers and therefore generating income from those digital services.

Table 4.22 BK Financial Performance ratios

	2016	2017	2018	2019	2020
Return on Assets (%)	3.5	3.4	3.4	3.9	3.3
Return on Equity (%)	20.0	20.2	17.2	18	16
Cost to Income ratio (%)	47.4	45.2	48.1	42.2	32.5
Net Interest Margin (%)	10.5	10.8	10.4	11.0	10.7
Loan yield (%)	17.6	16.2	15.3	16.2	15.7
Cost of Funds (%)	3.3	3.2	3.0	3.1	3.8

Source: BK Annual report (2016-2020)

According to secondary data from the Bank of Kigali, the financial performance ratios indicates the viability and stability of the bank. The ROA reflects the percentage of profit the Bank of Kigali gained in relation to its overall resources, it has been on the rise from 2016 to 2019 meaning the bank has been utilizing well its assets and generating value to its shareholders, despite a decrease of ROA and ROE in 2020 that is mainly linked to the covid-19 challenges that faced the banking industry and economies around the world. The cost to income ratio also has decreased from 47.4% in 2016 to 32.5% in 2020 meaning the bank is running more profitable. The loan yield of BK as at end year 2020 was 15.7% which means it is what they earned on money lent to its customers while the bank's cost of fund as at end year 2020 is 3.8% which represent the cost incurred when borrowing or taking deposits from its customers or stakeholders. The above financial performance ratios of Bank of Kigali show a strong and profitable financial institution.

5.1 Conclusion

In conclusion, there is a significant contribution of ATM usage at BK on its financial performance; there is a significant contribution of mobile banking on its financial performance and that there is a significant contribution of internet banking on its financial performance. Some of the main key determinants that drove the contribution of e-banking tools on financial performance of Bank of Kigali were the availability 24hours/7days ATM services and their strategic location, the number of users and uptime of mobile banking services and the BK app and electronic funds transfers for

internet banking. Recently due to covid-19 reasons, the number of bank customers using e-banking tools has significantly increased and the above determinants have been very key for banks to be able to provide its services but also they allowed customers to have access to their funds without the need to go to banking halls. The researcher had taken Bank of Kigali as a case study and as the study revealed a significant contribution of e-banking tools on financial performance of Bank of Kigali, the researcher concludes that e-banking tools contributes a lot on financial performance of commercial banks in Rwanda.

5.2 Acknowledgement

Praise to the almighty God because of bestowing grace upon me as well as enabling me to achieve my goals. My supervisor. Appreciation goes to all of my family for their unwavering love, motivation and support. My heartfelt gratitude also goes out to Bank of Kigali for their assistance and contribution to my research. Finally, appreciation goes to Mount Kenya University, particularly the managers, administrators, classmates, and professors of the School of Business

6. REFERENCES

[1] Athanasoglou, P. P., Brissimis, S. N. & Delis, M. D. (2018). Bank-specific, industry specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, *18*(2), 121-136.

[2] Boyd J. H., Levine R. & Smith B. D. (2010). *The Impact of Inflation on Financial Sector Performance*. University of Minnesota, Minneapolis, USA.

[3] Busch, R. & Kick, T. (2019). Income diversification in the German banking industry. *Banking and Financial Studies, 5(4),23-30.*

[4] Casalo, L.V., Flavian, C. and Guinaliu, M., (2017). The role of security, privacy, usability and reputation in the development of online banking. Online Information Review, 31 (5), pp.

[5] Central Bank of Kenya. (2014). *Monetary Policy Statement,CBK Act,Cap 491* .

[6] Chen, C. (2009). *Bank Efficiency in Sub-Saharan African Middle.Income Countries,* IMF Working Paper No. 04/14.

[7] Claus, I. & Grimes, A. (2013). Asymmetric Information, Financial Intermediation and the Monetary Transmission Mechanism. *A Critical Review Journal 12(5), 5-8.*

[8] Clive, W (2007). Academics Dictionary of Banking, New Delhi, India: Arrangement Academic

[9] Collins, N. J. & Wanjau, K. (2011). The Effects of Interest Rate Spread on the Level of Non-Performing Assets: A Case of Commercial Banks in Kenya. *International Journal of Business and Public Management* Vol. 1(1), 5-20. Crowley, J. (2007). Interest Rate Spreads in English-Speaking African Countries. *IMF* Working *Paper*, WP/07/101.

[10] Cooper, D. R. & Schindler, P.S. (2010). *Business research methods*. New York, NY: Irwin/McGraw-Hill.

[11] Deyoung, R. & Rice, T. (2014). Noninterest Income and Financial Performance at U.S. Commercial Banks. *The Financial Review*, *39*(1), 101-127.

[12] Diamond, D. W. (2014). Financial intermediation and delegated monitoring, *Review of Economic Studies* 51, 393-414.

[13] Edet, O. (2018). Online transaction in Banking Industries and its Effects. International Journal of Investment and Finance, Vol. 3, A.P 10-16.

[14] Eelton, E. & Gruber, M. (2017). Money Banking and the Economy. *Journal of Banking & Finance, 20*(8), 1440-1441.

[15] Fox, S. and Beier, J., (2016). Online banking 2006: surfing to the bank. Pew Internet & American Life Project, [internet].

[16] Gautam L et al.; Sch J Econ Bus Manag, 2014, E-banking in India: Issues and challenges

[17] Gurley, J. & Shaw, E. (2010). *Money in a Theory of Finance*, Washington, DC: Brookings Institutions.

[18] Harelimana, J.B. (2017). Impacts of mobile banking on the performance of Unguka Bank Ltd. *Grobal Journal of Management and Business research*: Finance. 17(5)20-28.

[19] Harelimana, J.B. (2018). Automated Teller Machine and profitability of Commercial Bank in Rwanda. *Grobal Journal of Management and Business research*: Finance. 18(1)1-8.

[20] Hidayat, W., Kakinaka, M. & Miyamoto, H. (2012). Journal of Asian economics, volume 9 (1989). *Journal of Asian Economics*, *15*(23), 335-343.

[21] Hugo, G. W. (2013). *Effects of Income Source Diversification on Financial Performance of Commercial Banks In Kenya*. (Unpublished MBA Project).University of Nairobi, Nairobi.

[22] Ibrahim, D. (2019). Boosting Payment Solution with Visa Card. Daily Champion, P. A.

[23] Institutions

[24] James, A. (2019 April 21). Boosting Payment Solution with visa Cards. Daily Champion, P.A.12.

[25] James, O. (2019). E-payment and its Challenges. Daily Champion, P.A. 13.

[26] Jegede, C.A. (2014). Effects of Automated Teller Machine on the performance of Bank in Nigeria. American Journal of Applied Mathematics. 2(1),40-46.

[27] Josefsson, T. (2015) Internet banking and the Technology Acceptance Model

[28] Journal of Retailing and Consumer Services. Vol. 13 (6), 431–443

[29] Kaberia, F. M. (2012). *The Effects of Income Source Diversification on Financial Performance of Commercial Banks in Kenya*. (Unpublished MBA Project). University of Nairobi, Nairobi

[30] Kapado, J., Vaghela, P,S. (2018). The impacts of internet on financial performance of selected Bank in India. *International journal of commerce and management*. 6(10)1-13.

[31] Karlos, S. (2019). The determinants of banks' non-interest income, *International Journal of Project Management*, *28*(8), 832-841.

[32] Key, P. J. (2017). *Research design in occupational education*: *A thesis hand book*. Oklahoma, OK: Oklahoma State University.

[33] Kiprop, V., AYuma, C., Ambrose, (2016). Effects of mobile banking on financial performance of commercial bank in Kapsabat Town. *IOSR Journal of Business management* 18(10),37-48.

[34] Kinoti Faith Kagendo (2015) E-banking strategy and performance of commercial banks in Kenya P 14-15

[35] Kiweu, J. M. (2012). *Income Diversification in the Banking Sector and Earnings Volatility: Evidence from Kenyan Commercial Banks*. (Unpublished MBA Project).University of Nairobi, Nairobi.

[36] Korajczyk, R. A. (2019). Asset Pricing and Portfolio Performance: Models, Strategy and Performance Metrics.. *Journal of Political Economy*, *10*(2), 346.

[37] Kothari, C.R. (2014). Research Methodology, methods and techniques (2nd ed.). India, Jaipur:
[38] Lintner, J. (2015). "The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets." *The Review of Economics and Statistics* 47, 13–37.
[39] Littler, D. and Melanthiou, D. (2016). Consumer perceptions of risk and uncertainty and the implications for behavior towards innovative retail services: the case of Internet banking.
[40] Lo, A. W. (2014). The Adaptive Markets Hypothesis. *The Journal of Portfolio Management*, *30*(5), 15-29.
[41] Macharia, G. (2019). *Commercial Banks' Perception of the Influence of Mobile Telephones of Growth of Banking Business in Kenya.* (Unpublished MBA Project).University of Nairobi, Nairobi.
[42] Maheshwari S.N. (2015). Financial Accounting. 4th edition, New Delhi: SULTAN CHAND & SONS Educational Publishers.
[43] Markowitz, H. M. (2012). "Portfolio Selection." *The Journal of Finance* 7 (1), 77–91
[44] Marvaniya, N. M. (2011). *A Comparative Study of Non-Fund Based Income Of Selected Public Sector Banks & Selected Private Sector Banks in India*, Thesis PhD, Saurashtra University,India.
[45] Mossin, J. (2016). "Equilibrium in a Capital Asset Market." Econometrica 34 (4), 68– 783.
[46] Mugendi, P. K. (2002). The impact of non-interest income on the earnings volatility of *commercial banks in Kenya*. (Unpublished MBA Project).University of Nairobi, Nairobi.
[47] Muia, A. M. (2013).*The relationship between financial innovation and growth in profitability of islamic banking in kenya*. (Unpublished MBAProject).University of Nairobi, Nairobi.
[48] Mukamana, S. (2019). *Impacts of Automated Teller Machine (ATM) transactions on financial performance of commercial bank in Rwanda*. A case of BK. A thesis submitted to University of Rwanda. Kigali-Rwanda.
[49] Mundu, H. (2010). Importance of e-payment on Clearing and Forwarding.DailySun, P.A.8.
[50] Mwatsiko, c. (2016). Impacts of ATM Banking performance on customer satisfaction in Bank of Malawi. *International journal of Business and Economic Research. Research* .5(1) 1-9.
[51] National Bank of Rwanda (2019), Risk Management guidelines for Non-Bank Financial
[52] New Age International limited publishers
[53] New Delhi
[54] Ninlanjan Ray (2016) Impact of Internet Service Quality (IS-QUAL) on Client Satisfaction
[55] Ngugi, R. (2001). An Empirical Analysis of Interest Rate Spread in Kenya. *African Economic Research Consortium*, 1, 106-121.
[56] Nzongang, T. & Atemnkeng, J. (2016*). Market Structure and Profitability Performance in the Banking Industry of CFA countries: the Case of Commercial Banks in Cameroon.* Worldnet Publishers, Cameroon.
[57] Numtip T. & Parichard B. (2015). Determinants of users' intentions to use mobile information technologies
[58] Okiro ,K., Ndungu, J.(2013).The impacts of Mobile banking and Internet banking on the pedoemance of financial Instution in Kenya. *European Scientific Journal*. 9(13) 1-16.
[59] Oleka, J. (2019). E-payment and Its Challenges.Daily Champion, P.A.13.
[60] Olweny, T. & Shipho, T. M. (2011). Effects of Banking Sectoral Factors on the Profitability of Commercial Banks in Kenya. *Economics and Finance Review, 1(5), 1-30.*
[61] Omotayo, G. (2007). A Dictionary of Finance, West Bourme, England: West Bourme Business School.
[62] Plihon, D. & Gamra, S. (2013). *Revenue diversification in emerging market banks: implications for financial performance*, Punjab publishers, India.
[63] Rhyne, E. (2002). The Yin and Yang of Microfinance: Reaching the Poor and Sustainability. *Microbanking Bulletin*, 3(1), 45-46.
[64] Rongnian, Z. & Muhong N. (2009). On the Relationship between Non-interests Business and Bank Features of the Commercial Banks in China .*Journal of Financial Research, 5(5), 21-23.*
[65] Saunders, M., Lewis, P., & Thornhill, A. (2003).*Research Methods for United Kingdom*. New York, NY: Pearson Education.
[66] Sharpe, W. F. (1964). "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk." *The Journal of Finance* 19 (3), 425–442.
[67] Tarazi, A., Lepetit, L., Nys, E. & Rous, P. (2017). Bank Income Structure and Risk: An Empirical Analysis of European Banks. *Journal of Banking and Finance*, 4(1), 10-11
[68] Tregenna, F. (2009).The fat years: the structure and profitability of the US banking Sector in the pre-crisis period. *Cambridge Journal of Economics, 5(1), 12-15*
[69] Uzhegova, O. (2010). *The Relative Importance of Bank-specific Factors for Bank Profitability in Developing Economies*, 1(1), 5-30
[70] Waweru, N. and Kalani, V. (2009*).* Commercial Banking Crises in Kenya: Causes and Remedies. *African Journal of accounting Economics, Finance and Banking Research,* 25(4), 50-55.
[71] White, L. (2018). Inflation. *The Concise Encyclopedia of Economics*, *45*(09), 45-46.
[72] Williams B. & Rajaguru G. (2010). *The Chicken or the Egg? The Trade-Off between Bank Non Interest Income and Net Interest Margins,* 20th Australasian Finance & Banking Conference Paper, Australia.