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Effect of Electronic Banking on Customer Satisfaction in Rwanda: Case of Bank of Kigali Headquarter

Dr. Mutesi Jean Claude[1*]

[1]Ph.D., Director of Budget and Finance of African Youth Commission (AYC), Lecturer at University of Kigali, KG 541 St, Kigali, Rwanda

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***Corresponding author:** Dr. Mutesi Jean Claude
Ph.D., Director of Budget and Finance of African Youth Commission (AYC), Lecturer at University of Kigali, KG 541 St, Kigali, Rwanda

Abstract **Original Research Article**

The increase of digitalization enables financial institutions to provide electronic banking services or online banking to access the competitive advantage and dedicate much market share for themselves as it has a crucial role in increasing customers' satisfaction. Therefore, the main objective of the current study was to investigate the effect of electronic banking on customer satisfaction in Rwanda, the case of the Bank of Kigali. The entire target population of this research was 380, 000 populations composed of customers of Bank of Kigali in Rwanda. From there, the sample size was 625 respondents while simple random sampling techniques were used. The study used primary data collection and the researcher utilized a questionnaire. Validity and reliability were adopted in this research because it facilitated to hold high reliability if it can be repeated several times and the outcome is the same. Collected quantitative data were analyzed using computer software Statistical Package for Social Sciences (SPSS) version 23.0 to enable data analysis. To establish the effect of electronic banking on customer satisfaction the correlation coefficient and descriptive statistics were used. To test the linear relationship between predictor variables and outcome variables regression analysis was used. While descriptive statistics was very useful in this research to summarize the data. The researcher finds that the value of P is less than 0.0005 that is P<0.0005. Therefore, the study concluded that the regression model was statistically significant and predict the results from the study variables. On the side of the Model summary as the results exemplified that the R-value indicated some simple correlations between our variables. This demonstrated a higher degree of correlation between the dependent and independent variables from the study. Similarly, the R square proved how the total variation between all the dependent variables and customer satisfaction was in relation. This led us to conclude that there was a strong relationship between Information Technology, Electronic Mobile devices, Electronic Banking transactions, and financial policies with their influences on customer satisfaction. Both individuals, government, and private sectors should recognize the contributions that electronic banking is serving in improving both economic development and the living standards of the citizens. Based on the findings, there is still a need in improving and diagnosing network troubleshoots to enable quick services from the banks.

Keywords: Electronic banking, customer satisfaction, commercial bank.

1. INTRODUCTION

E-banking has been accepted in several profitable doings, progressing services like purchase and selling of products and services by using electronic facilities. Regardless of threats about the technology, the economy of the market and to make the world like one village has imposed profitable and financial institutions to implement E-banking to be connected to the activities of the banks' activities or more easily doing business greater than how it was in the previous periods. Here we can say that E-banking is smooth easier for the bank to hold control to its affiliated subordinate bank allocated at aloof as an outcome of technology progression (Mambi, 2010).

The international financial institutions including commercial banks, financial cooperatives, microfinance institutions, and others implement the E-banking facilities towards their clientele in directive to provide effective customer satisfaction. It is universally agreed that safe and efficient internet banking services used as international information technology system is essential for sound banking institutions in different countries like in Europe, America, Asia and Africa, etc (Alexan, 2015). The benefits derived from information technology systems as well as electronic banking are effective on beside of users. The electronic information technology system brings many benefits to users, convenience, security, record keeping, low cost, etc.

Customer satisfaction proves that the information technology system has the potential to eliminate or reduce the problems users face for example in the payment and another financial settlement system in general (Taylor, 2014).

The EU elaborated practice and implementation of electronic money from 2000, considering the example in Germany, France and England, adopted E-banking greatly extended than numerous further nations of the similar area, wherever mobile services they are used a comprehensive term that denotes a choice of financial services that can access to the mobile phone transversely, mobile money transfer is one of the three leading procedures of financial service by using electronic facilities like mobile.

In the United Kingdom (UK) the Barclays Bank, ensured financial E-services whereby clients practice their movable devices when receiving and sending the value of money or additional just put, money transmission electronically from one individual to another person through electronic devices. Together national transfers as well as worldwide. (Barclays Bank, 2013).

Financial institutions in Ethiopia among 15 banks, very few of them are engaged with the diffusion of e-commerce. Moreover, among several services of e-banking, they are limited to ATM service. The e-business, e-commerce is about using electronic techniques to create opportunities, create new markets, new processes, and growth in the formation of wealth using electronic mediums. The banking system in Ethiopia has largely been affected by the dominance of cash. In Ethiopia, cash is king since the bulk of personal consumption is done by the intermediate of cash (Abraham, 2012).

In Rwanda, financial institutions are making substantial technological investments in improving their setups in a bid to ensure the provision of new and essential electronic financial services. Some of these electronic web-based retail banking services are making small firms adopt the use of technology at relatively favorable costs. Also, links have been developed between cell phones and bank accounts of corporations and individuals.

It has allowed clients to implement the practice of their cell phones as another banking channel. The services they enjoy through the use of mobile phones include deposits, withdrawals, fund transfers from one record to the other, settlement of bills, and also balance inquiry. Most of these mobile financial settlement services are additive in that they provide new delivery channels to their existing bank clients (NBR, 2018).

2. PROBLEM STATEMENT

Despite the usage of computerized innovation in the financial division, banks continue to recognize the long queues as their clients are still using different branches of banks at a vast rate compared to the previous one before the implementation of e-banking. Public awareness and willingness to adopt e-banking impacts its adequacy. Also, the speed of internet connection and its availability in different areas of the country affects the selection of web-based financial services.

The financial sector is key to supporting the economy of the country as the availability of the financial inclusions increases savings; hence, economic growth. Banks in Rwanda are facing the above challenges as the result of a lack of access to remote financial inclusion. From this concept, there are some problems regarding customer satisfaction through financial inclusion associated with the banking sector arise. Among those questions, the use of remote financial inclusion and how it is connected with its success factors have a remarkable effect on customer satisfaction in the banking sector (NBR Report, 2012).

All these worldwide and national findings show the existence of a research gap that concerns the appropriate use of financial inclusion, especially electronic banking, in the delivery of service in the banking sector that can be enhanced if E-banking usage is used effectively and efficiently. Therefore, it is from previous issues that motivated the researcher to find out how electronic banking in the Bank of Kigali affects customer satisfaction.

3. OBJECTIVES OF THE STUDY

This study paper has a general objective and specific objectives.

General objective

The study investigates the effect of electronic banking on customer satisfaction in Rwanda. Case of Bank of Kigali.

Specific objectives

Specifically, the research seeks to:

1. To investigate the effect of Information Communication Technology on customer satisfaction in Rwanda.
2. To examine the effect of Electronic Mobile Devices on customer satisfaction in Rwanda.
3. To establish the effect of Electronic banking transactions on customer satisfaction in Rwanda.
4. To examine the moderating effect of fiscal policies on the relationship between electronic banking on customer satisfaction in Rwanda.

4. HYPOTHESES

This study verified the null hypotheses follows.

1. **Ho1:** Information Communication Technology has no significant effect on customer satisfaction in Rwanda.
2. **Ho2:** Electronic Mobile device has no significant effect on customer satisfaction in Rwanda.
3. **Ho3:** E-banking transactions have no significant effect on customer satisfaction in Rwanda.
4. **Ho4:** Financial policies have no significant moderating effect between electronic banking and customer satisfaction in Rwanda.

5. REVIEW OF LITERATURE

5.1 Concept of electronic banking

Electronic banking alludes to the utilization of the Internet as a remote conveyance channel for giving administrations, for example, opening a bank account, transferring funds among diverse accounts, and electronic bill presentment and payment. This can be offered in two principal ways.

A bank with physical offices can build up a Website and offer these services to its clients notwithstanding its customary conveyance channels. The second is to set up a virtual bank, where the personal computer server is housed in an office that serves as the lawful location of such a bank. The banks offer their clients the capacity to make deposits and withdraw funds utilizing ATMs (Automated Teller Machines) or other remote conveyance channels claimed by different foundations, for which an administration expense is acquired (Timothy, 2012).

The availability of Automated Teller Machines (ATM), cards, telephone banking, personal computer banking, and internet banking has existed nowadays in the banking system (Narteh, 2014). E-banking covers both computer and telephone banking (Miranda, 2009).

5.2 Concept of Customer Satisfaction

Satisfaction can be described as the feedback of a post-purchase assessment of a certain service/product's quality, and compared with the expectation of the prior-purchasing stage (Kotler & Keller, 2011). Customer satisfaction, in general, identifies customers' reactions in the perspective of the institutions in fulfilling their obligations and customer judgment of the satisfaction concerning the service offered by the institutions. Customer satisfaction is a much sought after phenomenon in today's highly competitive and globalized marketplace.

5.3 Theoretical Review

5.3.1 Theory of Planned Behavior (TPB)

Theory of planned behavior (TPB) has been successfully used to predict users' acceptance of IT (Amjad and Wood, 2009). It links the relationships between attitudes and behavior of an individual. The concept was proposed by Ajzen in 1985 to improve the predictive power of the theory of reasoned action by including perceived behavioral control (Koger and winter, 2010).

The theory states that attitude toward behavior, subjective norms, and perceived behavioral control, together shape an individual's behavioral intentions and behaviors (Sniehotta, 2009). This theory helps to understand how the behavior of people can change. The TPB is a theory that predicts deliberate behavior because behavior can be deliberative and planned. TPB is the successor of the similar Theory of Reasoned Action of Ajzen and Fishbein (Koger and winter, 2010).

Attitude towards the behavior is defined as the individual's positive or negative feelings about performing the behavior (McIvor & Paton, 2007). Behavioral intention is a sign of an internet banking adopter's readiness to carry out certain conducts or behaviors. According to TPB, an internet banking adopter's performance of a certain behavior is determined by his or her intent to perform that behavior. Planned behavior theory was applied to study the relations among beliefs, attitudes, and behavioral intentions in this study because is a very powerful and predictive model for explaining human behavior. That is why the researcher used it in electronic banking and customer fields.

By predicting customers' intention to adopt Internet banking is an important issue that facilitates financial institutions attempt to understand how a customers' belief, embracing attitude, subjective norm and perceived behavioral control, can influence intention and hoe their attitudes and intentions to behave in a certain way are mediated by goals rather than needs, the TPB shows good applicability in regards to antisocial behaviors, such as using deception in the online environment. But on the other side, based on the reviewed literature this theory has some weaknesses since it does not account for other variables that factor into behavioral intention and motivation, such as rumors, threat, mood, or experience and it considers normative influences, it still does not take into account environmental or economic factors that may influence customers' intention to perform a behavior.

5.3.2 Technology Acceptance Theory

The Technology Acceptance theory was proposed by (Bagozzi, et al., 1992) appears to be the most widely used innovation adoption model. This theory has been used in a variety of studies to explore the factors affecting an individual's use of new technology. The sequential relationship of belief–attitude–intention– behavior in TAM enables us to predict the use of new technologies by users. TAM is an adaptation of the Theory of Reasoned Action (TRA) regarding information systems which notes that perceived usefulness and perceived ease of use determine an individual's attitudes towards their

intention to use innovation to serve as a mediator to the actual use of the system. Perceived usefulness is also considered to be affected directly by perceived ease of use. In the case of system adoption, according to (Hanafizadeh, et al., 2014), used the TAM model. This theory asserts that perceived usefulness and ease of use are fundamental determinants of system adoption and usage (Bankole, et al., 2011). Perceived risk, the perceived cost of use, compatibility with lifestyle, and perceived security (Hsu, et al., 2011). By choosing this theory, the researcher would like to show how technology acceptance theory can be adopted in this research for the reason that, behavioral intention is a factor that leads people to use the technology. It means that using this theory shows how behavioral intention (BI) is influenced by customers' attitude which is the general impression of the technology and this leads to better prediction of the use of new information resources. Also, this shows how confidence in the use of technology can lead to increase personal control, flexibility, and competent use of information. Therefore, increased knowledge leads to better productivity and customer satisfaction. Criticisms were untaken based on the literature reviewed, where it gives the impression that technology acceptance theory could not be sufficiently in predicting the acceptance of information communication technology (ICT) and provide comprehensive precursors to mobile use or social influence and conditions that facilitate behavior. Lastly, the TAM model pertains to the behavior of users, which is inevitably evaluated through subjective means such as behavioral intention (BI) and interpersonal influence.

5.4. Empirical Review

5.4.1. Information communication technology and customer satisfaction

Information and communication technologies (ICT) refers to technologies that provide access to information through telecommunications. The introduction of electronic banking has improved banking efficiency in rendering services to the customer. Information and Communication Technology is at the center of the electronic banking system in today's financial institution's activities (Steven, 2002).

5.4.2. Electronic Mobile Devices and customer satisfaction

Electronic mobile devices mean any hand-held or other portable electronic equipment capable of providing data communication between two or more individuals, including, but not limited to, a text messaging device, a paging device, a personal digital assistant, a laptop computer, equipment that is capable of playing a video game or a digital video disk, or equipment on which digital images are taken or transmitted. Mobile devices are components for controlling the flow of electrical currents for information processing and system control (Keon, *et al*., 2020).

5.4.3. Electronic banking transactions and customer satisfaction

E-banking transactions, means cash withdrawals, deposits, account transfers, payments from bank accounts, disbursements under a preauthorized credit agreement, and loan payments initiated by an account holder at a communications facility and accessing his or her account by using computers and telecommunications through telephone or computer rather than through human interaction (Lal, 2012). According to Katariina (2006), the rising character of the internet as a service channel has eliminated the locus of power from service providers to consumers, and therefore, cooperation with and learning from consumers as well as adaptation to their individual and dynamic necessitates have become crucial. These dimensions of IBS have been investigated to enhance our knowledge of consumers' perceptions and opinions about IBS. IBS can provide the result of cluster analysis more clarify and refine the picture of consumers.

5.4.4. Moderating effect of financial policies on the relationship between electronic banking and customer satisfaction

Financial policies refer to policies related to the regulation, supervision, and oversight of the financial and payment systems, including markets and institutions, with the view to promoting financial stability, market efficiency, and client-asset and consumer protection(Code of Good Practices on Transparency in Monetary and Financial Policies, 2002).

5.5. Conceptual framework

A conceptual framework illustrates what the researcher expects to find through the ongoing research, the given conceptual framework as illustrated in the designed figure defines the relevant variables for the current research and maps out how variables might relate to each other. The research was made in such a way of electronic banking on customer satisfaction in the Bank of Kigali. Figure 1 indicates the independent variables with three factors, Information communication technology; electronic mobile Devices, and E-banking transactions. On the other hand, customer satisfaction as the dependent variable is composed of customer loyalty; compliments & retention; customer satisfaction and enjoyment; the speed of delivery; ease of use; convenience; privacy and security; trust, simplicity, and reliability and control. The relationship here is that electronic banking impacts customers' satisfaction which is to be identified and analyzed and may serve as a tool in financial institutions.

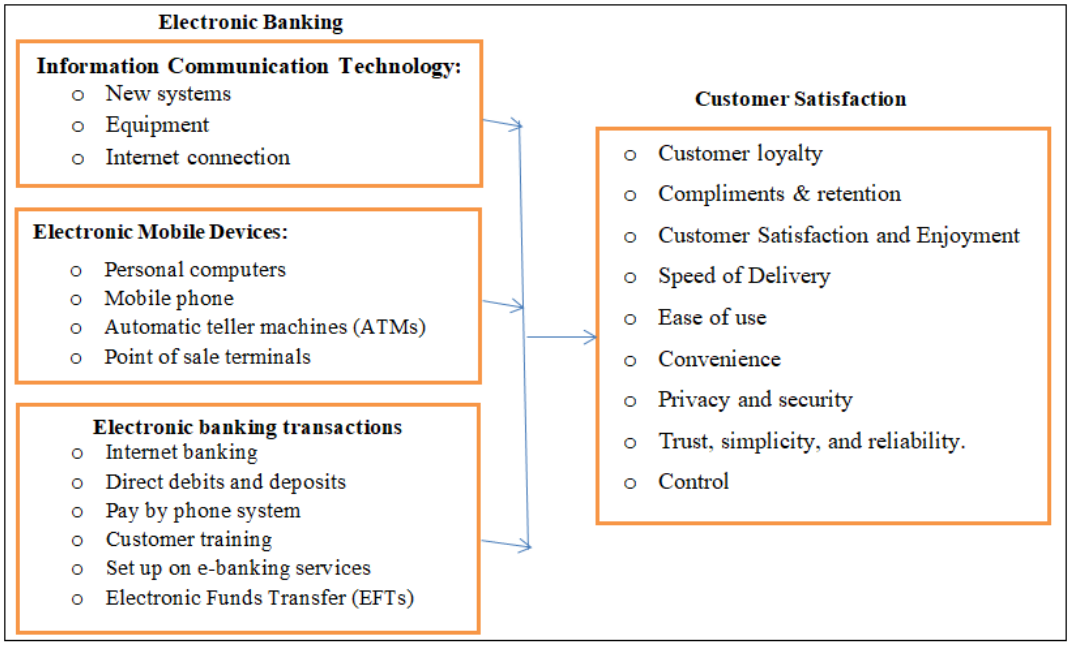

Figure 1: Conceptual framework.
Source: *Researcher, (2021)*

6. MATERIALS AND METHODS

The explanatory research design was used in this study for increasing the understanding of a researcher on e-banking and customer satisfaction, where sources such as published literature or data, was commonly used in the explanatory. A great understanding of the subject allows the researcher to hone subsequent research questions and was great increases the usefulness of a study's conclusions on the effect of electronic banking on customer satisfaction.

Target population

The entire population of the study who are supposed to provide the information data related to the objectives of the research study was based on 380,000 customers (clients) of Bank of Kigali in Rwanda; therefore, the entire target population of this research is 380,000 populations.

Sample size and sampling procedures

A sample was a smaller set of standards designated from the population. This study practices 4% of margin errors and privacy level is 96%. The study applied the formulation of Taro Yamane to control the sample size of this study.

Where:

$$n = \frac{N}{1 + N(e)^2}$$

n = Sample Size N = Study Population e = Margin of error

And then the sample size is: $n = \frac{380\,000}{1+380\,000\,(0.04)^2}$;

$n = \frac{380\,000}{608} = 625$

Then the sample size is 625 respondents. Therefore, for the current study, the sample size is 625 respondents who were selected from customers (clients) of the Bank of Kigali. Sampling techniques for this study were both simple random and purposive random. Purposive sampling was used to obtain Bank of Kigali Plc official, simple random was used because when sampling population all was having an equal probability of being selected, this was used. After all, every item in the population was having an even chance and likelihood of being selected in the sample. Simple random was used for the selection of customers in Bank of Kigali Plc, this was done because judgmental selective, or subjective sampling, was a form of non-probability sampling in which the researcher relied on her judgment when choosing members of the population to participate in their study.

Data Collection Instruments

Questionnaire technique

The questionnaire includes a series of closed questions about issues that are expected of the respondent information, where these types of questions were distributed by the researcher among respondents to collect the written and quantitative data related to electronic banking and customer satisfaction in Bank of Kigali Plc. The structures questionnaires in form of the Likert scale method by requesting respondents to respond to a series of statements by indicating whether he or they strongly agree (4), agree (3), disagree (2), and strongly disagree (1).

Documentation tool

According to Robert (2014), one of the basic advantages of document studies is to explore the sources more fully to obtain additional information on an aspect of the subject. This is the extensive study and review of published documents, reports, magazines, journals, and policy reports related to the topic. This is important because it reviews the literature and tries to locate global perspectives to make a comparative framework for analysis and evaluation for readers; therefore, the researcher used this documentary technique to conduct and get secondary data.

Data Analysis Methods

The data that was gathered from the questionnaires given to employees and customers of the Bank of Kigali Plc was analyzed using Statistical Package for Social Sciences (SPSS) version 23 with the help of software for analysis. The results obtained were recorded in form of frequencies, percentages, and tables. The Correlation Coefficient and descriptive statistics were used to examine the impact of the electronic banking system on customer satisfaction.

Correlation Analysis

This study employed Pearson's coefficient of correlation. Pearson's coefficient of correlation is a method that was used for measuring the degree of relationship between two variables. This coefficient enabled us to assume that there is a linear relationship between the two variables that the two variables are causally related which means that one of the variables is independent and the other one is dependent, and a large number of independent causes are operating in both variables to produce a normal distribution. In a sample, it is denoted by and is by r_s design constrained as $-1 \leq r_s \leq 1$.

Regression analysis model

Based on research objectives and null hypotheses, the following are multiple regression models that were developed in answering and finding the effects and relationship between e-banking and customer satisfaction. The regression model of this research was used in the form:

$$Y= \beta_0+\beta_1X_1+ \beta_2X_2+ \beta_3X_3 + \beta_4M_4 +\varepsilon$$

Where: Y= Customer satisfaction; X_1= Information communication technologies; X_2= Electronic mobile device: X_3= E-banking transaction; M_4= Financial policies (Moderator); and $\beta_1 - \beta_4$ = Slope or coefficient of estimates.β_0= constant, ε = Error term

Linearity of test

The linearity test is a requirement in correlation and linear regression analysis. Good research in the regression model there should be a linear relationship between the free variable and dependent variable. Linearity is most simply thought of as data that is a straight line when graphed. To perform linear regression on nonlinear data, a nonlinear transformation is applied to transform the data to linear form. Linearity tells us how well the instrument measurement corresponds to reality. In this case, we want linearity as close to 1.0 as possible.

7. RESULTS AND DISCUSSIONS OF FINDINGS

Findings confirmed the effect of Information communication technology on customer satisfaction in Rwanda; the effect of electronic mobile devices on customer satisfaction in Rwanda; the effect of Electronic banking transactions on customer satisfaction in Rwanda; and the effect of financial policies on the relationship between electronic banking on customer satisfaction in Rwanda. The results were interpreted in a very systematic way based on testing the linearity, homogeneity, normality, objectives, and also the relationship was established thanks to the use of correlation and regression analysis of the variables. The results indicated the total number of males was 395 and occupied 63.2% of the total number of respondents while the number of females' respondents who participated in the study was 230 and they occupied the lower percentage of 36.8 compared to that of males in the study.

7.1 Linearity of test

The relationship that might exist between our variables and the linear regression is always indicated by the linear test. According to Serial, the linearity test is the way that the researcher used to identify the linear relation that could exist between two variables "x" and "y" which is expressed in terms of the equation as y=dx where d is a constant and x, y stands as two variables. For this case, to understand the linear relationship that exists between electronic banking and customer satisfaction, we needed to run a linear test. The linear test could assume first that the relationship was linear, and we also assume that the relationship is a straight line. In case the research went well, the relationship will be proven, or we could make nonlinear projections to make a linear regression possible.

7.1.1 Linearity test of Information Communication Technology and Customer Satisfaction

Table 1: Linearity test for Bank operating hours in facilitating customer satisfaction

ANOVA Table[a,b,c]

			Sum of Squares	df	Mean Square	F	Sig.
Banks fulfills its promises at the time indicated * Bank operating hours are convenient to me and facilitate electronic banking on customer satisfaction	Between Groups	(Combined)	.014	1	.014	.282	.596
	Within Groups		13.246	263	.050		
	Total		13.260	264			
Bank insists on error free records * Bank operating hours are convenient to me and facilitate electronic banking on customer satisfaction	Between Groups	(Combined)	.000	1	.000	.038	.845
	Within Groups		1.985	263	.008		
	Total		1.985	264			
Bank's staff tell you exactly the time the service will be performed * Bank operating hours are convenient to me and facilitate electronic banking on customer satisfaction	Between Groups	(Combined)	.001	1	.001	.078	.781
	Within Groups		3.938	263	.015		
	Total		3.940	264			

Source: *Primary Data (2021)*

As per table No1, the ANOVA results show that the value of sig. deviation from linearity by 0.596, and we can conclude that there is a linear regression that existed from our variables. The two variables we are testing for linear are the Bank's staff telling you exactly the time you will be served and measuring their convenience to customers in facilitating electronic banking. The relationship can be described using the constant d in the equation of linear regression and the property of a function is compatible.

7.1.2 Linearity test of Electronic Mobile devices and Customer Satisfaction

Table 2: Linearity test for mobile banking applications to facilitate E-banking

ANOVA Table[a,b,c,d]

			Sum of Squares	df	Mean Square	F	Sig.
Bank's staff give me prompt service * Mobile banking applications facilitate E-banking	Between Groups	(Combined)	.000	1	.000	.031	.861
	Within Groups		3.939	263	.015		
	Total		3.940	264			
Bank's performs the services exactly at the first time * Mobile banking applications facilitate E-banking	Between Groups	(Combined)	.000	1	.000	.023	.880
	Within Groups		2.966	263	.011		
	Total		2.966	264			
Payments and transfers are speedily delivered * Mobile banking applications facilitate E-banking	Between Groups	(Combined)	.000	1	.000	.008	.931
	Within Groups		.996	263	.004		
	Total		.996	264			
E-banking is convenience and time saved * Mobile banking applications facilitate E-banking	Between Groups	(Combined)	.000	1	.000	.023	.880
	Within Groups		2.966	263	.011		
	Total		2.966	264			

Source: *Primary Data (2021)*

As per Table 2, the ANOVA results show that the value of sig. deviation from linearity by 0.596, and we can conclude that there is a linear regression that existed from our variables. The two variables we are testing for linear are the Bank's staff telling you exactly the time you will be served and measuring their convenience to customers in facilitating electronic banking. The relationship can be described using the constant d in the equation of linear regression and the property of a function is compatible.

7.1.3 Linearity test of Electronic banking and Customer Satisfaction

Table 3: Linearity test for Electronic banking

ANOVA Table[a,b]

			Sum of Squares	df	Mean Square	F	Sig.
I feel safe in my transactions with the E-bank * E-banking services have helped to reduce banks daily operating cost	Between Groups	(Combined)	.000	1	.000	.015	.902
	Within Groups		1.985	263	.008		
	Total		1.985	264			
Customers' personal information security is better now than it was before when using papers * E-banking services have helped to reduce banks daily operating cost	Between Groups	(Combined)	.000	1	.000	.023	.880
	Within Groups		2.966	263	.011		
	Total		2.966	264			

Source: *Primary Data (2021)*

Referring to table No3, the ANOVA outputs show that the value of sig. deviation from linearity was0.880, and we can conclude that there is a linear regression that existed from our variables. The two variables we are testing for linear are electronic banking with the customer satisfaction being safe and having privacy facilitating electronic banking and easy the procedure. The relationship can be described using the constant d in the equation of linear regression and the property of a function is compatible.

7.1.4 Linearity test of Financial Policies and Customer Satisfaction

Table 4: Linearity test for financial policies

ANOVA Table[a,b,c]

			Sum of Squares	df	Mean Square	F	Sig.
Bank gives me individual attention * Financial policies and government regulations has benefits for wider e-banking system and for the society	Between Groups	(Combined)	.000	1	.000	.011	.915
	Within Groups		2.966	263	.011		
	Total		2.966	264			
Overall satisfaction with your bank's services offer * Financial policies and government regulations has benefits for wider e-banking system and for the society	Between Groups	(Combined)	.001	1	.001	.023	.879
	Within Groups		5.864	263	.022		
	Total		5.864	264			

Source: *Primary Data (2021)*

According to the ANOVA results, we notice that the value of sig. deviation from linearity is 0.879, and we can conclude that there is a linear regression that existed between customers' satisfaction and financial policies. The relationship can be described using the constant d in the equation of linear regression and the property of a function is compatible.

7.2 Regression analysis

In a very similar way, regression analysis proves the relationship that exists between two variables. We predict that the relationship should exist between the dependent variable and each of the independent variables or more variables at once.

7.2.1 Testing Objectives: The Effect of Electronic Banking on customer satisfaction in Rwanda

Table 5: Regression analysis for the effect of Electronic Banking

ANOVA						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	.475	5	.095	7.108	.000[b]
	Residual	3.464	259	.013		
	Total	3.940	264			
2	Regression	.489	5	.098	16.924	.000[b]
	Residual	1.496	259	.006		
	Total	1.985	264			
3	Regression	.316	6	.053	5.120	.000[b]
	Residual	2.650	258	.010		
	Total	2.966	264			
4	Regression	.498	5	.100	2.023	.076[b]
	Residual	12.762	259	.049		
	Total	13.260	264			

Source: *Primary Data (2021)*

The ANOVA table as per No5 exemplifies a better understanding of how the regression equation predicts the behaviors of the variables. The equation proves that the data are fit. The regression equation or model predicts that the dependent variable is strongly significant as the data sample we have is fit.

In the "sig." column, we find that the value of P is less than 0.0005 that is P<0.0005 (note that the value less than 0.0005 is interpreted as 000 in the SPSS outputs). Therefore, we conclude that the regression model was statistically significant and predict the results from our variables.

The results in the ANOVA table prove better how the regression equation predicts the behaviors of the variables and shows that the data are fit. The regression model project that the dependent variable is strongly significant as the data sample we have is fit. Checking on the "sig." column, we could find that the value of P is less than 0.0005 that is P<0.0005 (note that the value less than 0.0005 is interpreted as 000 in the SPSS outputs). The value of p is 0.000. Henceforth, we conclude that the regression model was statistically significant and predict the results from our variables. The ANOVA table above proves that our regression equation predicts the behaviors of the two variables which are the usage of electronic banking transactions and customer satisfaction and the model of this equation proves that the data are fit.

The regression equation or model predicts that the dependent variable is strongly significant as the data sample we have is fit. In the "sig." column, we find that the value of P is less than 0.0005 that is P<0.0005 (note that the value less than 0.0005 is interpreted as 000 in the SPSS outputs).

The value of p is 0.000. As a way of confirming, the researcher concludes that the regression model was statistically significant and predict the results from our variables. Next, the ANOVA table as indicated above shows a better understanding of how the regression equation predicts the behaviors of the two variables. The regression equation proves that the data are fit. The regression model foretells that the dependent variable is strongly significant as the data sample we have is fit. Referring to the "sig." column, we find that the value of P is less than 0.0005 that is P<0.0005. The value of p is 0.000. With this in mind, we conclude that the regression model was statistically significant and foretell the results from our variables.

7.2.2 Regression analysis of the effect of Electronic Banking on customer satisfaction in Rwanda

Table 6: Model summary for effects of Electronic Banking

Model Summary									
Model	**R**	**R Square**	**Adjusted R Square**	**Std. error of the Estimate**	**Change Statistics**				
					R Square Change	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.347[a]	.121	.104	.11565	.121	7.108	5	259	.000
2	.496[a]	.246	.232	.07600	.246	16.924	5	259	.000
3	.326[a]	.106	.086	.10136	.106	5.120	6	258	.000
4	.194[a]	.038	.019	.22198	.038	2.023	5	259	.076

Source: *Primary Data (2021)*

By analyzing the Model summary table above, the results exemplify that the R-value is a simple correlation estimated at 0.347. This should be seen as a positive degree of correlation between Information Technology and customer satisfaction. Similarly, the R square proves how the total variation between Information Technology and customer satisfaction. Indeed, Information technology can be explained as the independent variable to affect how customers are served and satisfied, and in percentage is 12.1%. We could

relate the relationship simply as it is obvious that information technology will affect how customers are served on a higher level. This led us to conclude that there is a strong relationship between two variables which are Information Technology Vs customer satisfaction. Interpreting the Model summary table above, the results we have demonstrated that the R-value is a simple correlation estimated to 0.496. This should be seen as a positive degree of correlation between Information Technology and customer satisfaction. Similarly, the R square proves how the total variation between Information Technology and customer satisfaction.

Indeed, Information technology can be explained as the independent variable to affect how customers are served and satisfied, and in percentage is 24.6%. We could relate the relationship simply as it is obvious that electronic devices will affect how customers are served on a higher level. Finally, we conclude that there is a strong relationship between two variables which are electronic mobile devices Vs customer satisfaction. By analyzing the Model summary table above, the results exemplify that the R-value is a simple correlation estimated at 0.326*. This should be seen as a positive degree of correlation between Information Technology and customer satisfaction. Similarly, the R square proves how the total variation between Information Technology and customer satisfaction. Indeed, Information technology can be explained as the independent variable to affect how customers are served and satisfied, and in percentage is 10.6%. We could relate the relationship simply as it is obvious that electronic banking transactions will affect how customers are served and boost their satisfaction. In the end, this leads us to conclude that there is a strong relationship between two variables which are electronic banking transactions Vs customer satisfaction. To interpret the Model summary table above, the results demonstrate that the R-value is a simple correlation estimated at 0.194.

This should be seen as a positive degree of correlation between financial policies and customer satisfaction. In the same way, the R square proves how the total variation between the financial policies and customer satisfaction. Financial policies can be explained as the independent variable to affect how customers are served and satisfied and in percentage is 3.8%. This percentage shows that the effects that financial policies make on the customers' satisfaction remain unmeasurable and contribute to the effectiveness of banking operations. We could simply relate the relationship simply as it is obvious that these financial or bank policies will affect how customers are served on a higher level. This led us to conclude that there is a strong relationship between two variables which are financial policies and customer satisfaction.

7.3 Hypothesis test

Pearson Correlation coefficient foretells the degree to which the association between dependent and independent variable exist. The correlation coefficient demonstrates the relationship between our data set. Like Wigmore says, the correlation coefficient is also defined as the indicator of the relationship between two variables in research. It is a statistical measure in which one change from a variable predicts the number of changes that could happen to another variable. The correlation coefficient can only exist in a range of -1 being the lowest and +1 being the highest correlation indicator. Henceforth, correlation signifies that the variables can also be interchanged to get similar results. Throughout this study, we measured the degree of freedom to assess the possibilities that could lead us to reject the null hypothesis. Thanks to the one-sample test and t-statistics, we were able to relate the degree of freedom from the variables and established a conclusion also based on the value of P from a one-sample test table.

Hypothesis 1: *Information Communication Technology has no significant effect on customer satisfaction in Rwanda*

Table 7: Coefficient regression of Information Communication Technology

Coefficients								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
1	(Constant)	2.786	.937		2.973	.003	.941	4.631
	Distance to the office or premises of the bank facilitate electronic banking on customer satisfaction	.312	.067	.710	.177	.009	.144	.120
	Bank has modern equipment and tools that facilitate electronic banking on customer satisfaction	.488	.082	.508	.145	.005	.174	.150
	Bank operating hours are convenient to me and facilitate electronic banking on customer satisfaction	.612	.052	.613	.228	.000	-.115	.091
	Bank's physical facilities virtually nice facilitate electronic banking on customer satisfaction	.488	.082	.746	5.945	.000	.326	.650
	High technology facilitate electronic banking on customer satisfaction	.712	.116	.606	.103	.018	.240	.216

Source: Primary Data (2021)

The results from regression coefficient table No7, as shown in the unstandardized beta (B) coefficient column was significant because all beta coefficients were positive. This means that for every 1-unit increase in the predictor variable, the outcome variable will increase by the beta coefficient value, in our given table for Variable 1, this would mean that for every one-unit increase in High technology facilitate electronic banking on customer satisfaction contributes to the customer satisfaction, the dependent variable increases by 0.712 or 71.2%. The next column is the standard error for the unstandardized beta (SE B). This value is similar to the standard deviation for a mean. The larger the aggregates the more spread out the points are from the regression line. The more spread out the numbers are, the less likely that significance will be found. Considering the standardized beta (β). This works very similarly to a correlation coefficient. It will range from 0 to 1 or 0 to -1, depending on the direction of the relationship. The closer the value is to 1 or -1, the stronger the relationship. In our case, the standardized beta results show that there are all positive, which means that factors of communication technology have a strong positive relationship with customer satisfaction. The *t* column for data analysis is the t-test statistic (t). This is the test statistic calculated for the individual predictor variable. This is used to calculate the p-value. Lastly, the researcher calculated the P-Value in the last column of Sig. probability level (p). This shows whether or not an individual variable significantly predicts the dependent variable. Considering our study results in p-value is below P<.050, the value is considered significant. Therefore, the researcher rejects the null hypothesis saying that Communication technology has no significant effect on customer satisfaction in Rwanda, and takes an alternative hypothesis by confirming that, communication technology has a significant effect on the performance of insurance firms in Rwanda.

Hypothesis 2: *Electronic Mobile devices have no significant effect on customer satisfaction in Rwanda*

Table 8: Coefficient regression of Electronic Mobile devices

Coefficients								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
1	(Constant)	2.594	.703		3.689	.000	1.209	3.978
	Transfer funds, pay bills locate ATMs	.304	.076	.603	.051	.039	.154	.146
	Mobile phone	.496	.054	.596	9.195	.000	.390	.602
	Easy access and plentiful applications for smart phones	.704	.044	.805	.089	.030	.091	.083
	Automatic teller machines (ATMs) enable E-banking	.704	.076	.703	.051	.009	.154	.146
	Mobile banking applications facilitate E-banking	.914	.054	.604	.072	.002	.110	.102

Source: *Primary Data (2021)*

The results from regression coefficient table No8, as shown in the unstandardized beta (B) coefficient column was significant because all beta coefficients were positive. This means that for every unit increase in the predictor variable, the outcome variable will increase by the beta coefficient value, in our given table for Variable Easy access and plentiful applications for smartphones and Automatic teller machines (ATMs) enable E-banking, these would contribute to the customer satisfaction at the level of 0.704 or 70.4%. The next column is the standard error for the unstandardized beta (SE B). This value is similar to the standard deviation for a mean. The larger the aggregates the more spread out the points are from the regression line. The more spread out the numbers are, the less likely that significance will be found. Considering the standardized beta (β). This works very similarly to a correlation coefficient. It will range from 0 to 1 or 0 to -1, depending on the direction of the relationship. The closer the value is to 1 or -1, the stronger the relationship. In our given table, the standardized beta results show that there are all positive, which means that factors of communication technology have a strong positive relationship with customer satisfaction. The *t* column for data analysis is the t-test statistic (t). This is the test statistic calculated for the individual predictor variable. This is used to calculate the p-value. Lastly, the researcher calculated the P-Value in the last column of Sig. probability level (p). This shows whether or not an individual variable significantly predicts the dependent variable. Considering our study results p-value is below P<.050, the value less than 0.05 is shown as 0.000 in SPSS and is considered significant. Therefore, the researcher rejects the null hypothesis saying that Electronic mobile devices have no significant effect on customer satisfaction in Rwanda, and take the alternative hypothesis by confirming that, Electronic mobile devices have a significant effect on customer satisfaction in Rwanda.

Hypothesis 3: *Electronic banking transactions has no significant effect on customer satisfaction in Rwanda*

Table 9: Coefficient regression of Electronic banking transactions

Coefficients								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
1	(Constant)	3.568	.929		3.840	.000	1.738	5.398
	Bank's staff have the knowledge to answer all questions	.808	.049	.512	.208	.005	.085	.068
	Bank's staff behavior instills confidence in me	.808	.082	.905	.080	.007	.208	.192
	Electronic banking facilitate me to review recent transaction easily	.808	.082	.905	.080	.007	.208	.192
	Electronic banking facilitate me to check account balance (Available balance and statement history any time)	.325	.059	.325	5.524	.000	.209	.441
	Electronic banking facilitate me to manage investments	.808	.051	.609	.158	.000	.109	.093
	E-banking services have helped to reduce banks daily operating cost	.808	.072	.707	.113	.000	.150	.134

Source: *Primary Data (2021)*

The results from regression coefficient table No9 shows in the unstandardized beta (B) coefficient column were significant because all beta coefficients were positive. This means that for every unit increase in the predictor variable, the outcome variable will increase by the beta coefficient value, in our given table for Variables Bank's staff know to answer all questions; Bank's staff behavior instills confidence in me; Electronic banking facilitates me to review recent transaction easily; Electronic banking facilitates me to manage investments and E-banking services have helped to reduce banks daily operating cost contribute to the customer satisfaction at the level of 0.808 or 80.8%. The next column is the standard error for the unstandardized beta (SE B). This value is similar to the standard deviation for a mean. The larger the aggregates the more spread out the points are from the regression line. The more spread out the numbers are, the less likely that significance will be found. Considering the standardized beta (β). This works very similarly to a correlation coefficient. It will range from 0 to 1 or 0 to -1, depending on the direction of the relationship. The closer the value is to 1 or -1, the stronger the relationship. In our given table, the standardized beta results show that there are all positive, which means that factors of Electronic banking transactions have a strong positive relationship with customer satisfaction. The *t* column for data analysis is the t-test statistic (t). This is the test statistic calculated for the individual predictor variable. This is used to calculate the p-value. Lastly, the researcher calculated the P-Value in the last column of Sig. probability level (p). This shows whether or not an individual variable significantly predicts the dependent variable. Considering our study results p-value is below P<.050, the value less than 0.05 is shown as 0.000 in SPSS and is considered significant. Therefore, the researcher rejects the null hypothesis saying that Electronic banking transactions have no significant effect on customer satisfaction in Rwanda, and take the alternative hypothesis by saying that, Electronic banking transactions have a significant effect on customer satisfaction in Rwanda.

Hypothesis 4: *Financial policies have no significant effect on customer satisfaction in Rwanda*

Table 10: Coefficient regression of financial policies

Coefficients								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
1	(Constant)	4.476	1.951		2.294	.023	.633	8.319
	The government had established enabling legal environment for financial institutions and their customer.	.748	.922	.913	.214	.031	.486	.390
	Financial policies focus on the involvement in Financial Institutions to improve the ability of poor citizens to increase their wealth.	.748	.758	.618	.302	.003	.358	.263
	Financial policies concerning e-banking are suitable in addressing the customer needs and perception	.748	.529	.423	.369	.002	.301	.206
	Financial policies and government regulations have benefits for the wider e-banking system and the society	.748	.922	.913	.214	.031	.486	.390
	Financial policies set standards for complaints resolutions and handling all problems about e-bank to the benefit of customers.	.286	.492	.590	3.116	.002	.105	.466

Source: *Primary Data (2021)*

The results from regression coefficient table No 10, shown in the unstandardized beta (B) coefficient column was significant because all beta coefficients were positive. This means that for every unit increase in the predictor variable, the outcome variable will increase by the beta coefficient value, in our given table for Variables such as The government had established enabling legal environment for financial institutions and their customer; financial policies focus on the involvement in Financial Institutions to improve the ability of poor citizens to increase their wealth; Financial policies in relation with e-banking are suitable in addressing the customer needs and perception; Financial policies and government regulations have benefits for wider e-banking system and the society contribute to the customer satisfaction at the level of 0.748 or 74.8%. The next column is the standard error for the unstandardized beta (SE B). This value is similar to the standard deviation for a mean. The larger the aggregates the more spread out the points are from the regression line. The more spread out the numbers are, the less likely that significance will be found. Considering the standardized beta (β). This works very similarly to a correlation coefficient. It will range from 0 to 1 or 0 to -1, depending on the direction of the relationship. The closer the value is to 1 or -1, the stronger the relationship. In our given table, the standardized beta results show that there are all positive, which means that factors of financial policies have a strong positive relationship with customer satisfaction. The *t* column for data analysis is the t-test statistic (t). This is the test statistic calculated for the individual predictor variable. This is used to calculate the p-value. Lastly, the researcher calculated the P-Value in the last column of Sig. probability level (p). This shows whether or not an individual variable significantly predicts the dependent variable. Considering our study results p-value is below P<.050, the value less than 0.05 is shown as 0.000 in SPSS and is considered significant. Therefore, the researcher rejects the null hypothesis saying that financial policies have no significant effect on customer satisfaction in Rwanda, and takes an alternative hypothesis by saying that, financial policies have a significant effect on the customer satisfaction of financial institutions in Rwanda.

7.4 Correlation analysis

Table 11: Correlation matrix of Electronic Banking and Customer satisfaction

	Customer satisfaction	Information Communication Technology	Electronic Mobile Devices	Electronic banking transactions	Financial policies
Customer satisfaction	1				
Information Communication Technology	.496**	1			
Electronic Mobile Devices	.326**	.174**	1		
Electronic banking transactions	.347**	.247**	.134*	1	
Financial policies	.247**	.134*	.191**	.326**	1
* Correlation is significant at 0.5 level (2-tailed) ** Correlation is significant at 0.01 level (2-tailed)					

Source: *Primary Data (2021)*

From Table 11, we can see that the correlation matrix between the variables 'information communication technology; electronic mobile devices; electronic banking transactions; financial policies' and 'factors affecting customer satisfaction among financial institutions' is .496**; .326**; .347**and.247** respectively, and the p-value for the two-tailed test of significance is less than 0.0005 (values less than 0.0005 are shown as 0.000 in SPSS output) from these figures this can we conclude that there is a strong positive correlation between variables 'Information communication technology; electronic mobile devices; electronic banking transactions; Financial policies' and 'Factors affecting customer satisfaction among financial institutions and that this correlation is significant at the significance level of 0.01 and 0.5. We can reject the null hypothesis saying that there is no significant effect of 'information communication technology; electronic mobile devices; electronic banking transactions; financial policies' on customer satisfaction among financial institutions' and accept the alternative hypothesis stating that there is a significant relationship between 'information communication technology; electronic mobile devices; electronic banking transactions; financial policies' and 'factors affecting customer satisfaction among financial institutions in Rwanda.

8. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

This study was following a general objective that tackled the contribution of electronic banking to customer satisfaction, the effect of information communication technology, and effect of electronic mobile devices, electronic banking transactions, and the moderating effects of financial policies on the relationship between electronic banking on customer satisfaction, the case of Bank of Kigali.

The ANOVA tables proved better understandings of how the regression equation predicts

the behaviors of the dependent against independent variables, and the model equation proved that the data are fit in the equation. The regression models predicted that the dependent variable was strongly significant as the data sample we have is fit. In the "sig." column, we find that the value of P is less than 0.0005 that is P<0.0005 (note that the value less than 0.0005 is interpreted as 000 in the SPSS outputs).

Therefore, we concluded that the regression model was statistically significant and predict the results from our variables. The side of the Model summary exemplified that the R-value indicated some simple correlations between our variables. This demonstrated a higher degree of correlation between the dependent and independent variables from the study. Similarly, the R square proved how the total variation between all the dependent variables and customer satisfaction was in relation. This lead us to conclude that there was a strong relationship between Information Technology, Electronic Mobile devices, Electronic Banking transactions, and Financial policies with their influences on customer satisfaction.

RECOMMENDATIONS

Briefly, both individuals, government, and private sectors should recognize the contributions that electronic banking is serving in improving both economic development and the living standards of the citizens. Even though this study was concentrated more on some factors, there might be other factors that could make electronic banking better served and achieve effective results but these will be seen as the technology is an evolving field.

There is still a need in improving and diagnosing network troubleshoots to enable quick services from the banks. Throughout this study, different respondents tackled the problem of inadequacy and poor networks that are not easy and deceiving while making transactions. This will be done by increasing the frequency to which electronic banking services are provided which will mark the evolution banking system.

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