Volume 18 Issue 4
Originally issued as C1



Global Journal of Management and Business Research: C Finance
Volume 18 Issue 1 Version 1.0 Year 2018
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

The Automated Teller Machines and Profitability of Commercial Banks in Rwanda

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Abstract- A study on Automated teller machines (ATM) and profitability of commercial bank was conducted in this paper under a period from 2010 to 2016 with the aim of assessing the use of ATM and its contribution to the profitability in bank of Kigali. Quantitative and qualitative Methods of data collection were employed including questionaires in collecting primary data. The total population was 334,121 ATM users at BK where a sample of 200 respondents were used. The findings have shown that in Bank of Kigali still faces an obstacle on lack of financial education (information, training…) of the customers about how to use ATM cards in general. The evolution of the profitability shows that the profitability of the Bank of Kigali remained intact with, ROA, ROE and net margin of 4.0%, 22.9% and 9.9%, respectively in 2014. 4.0%, 22.2%, 11.1% in 2013. When the correlation of variables is < 0.5 the hypothesis is rejected when the correlation of variables is > 0.5, therefore the hypothesis confirmed that there is a significant relationship between automated teller machines and profitability of Bank of Kigali where the finding shows that the correlations between ATM and ROA, ROE and net margin are > 0.5. Lower cost, differentiation and accessibility are factors determinants level of satisfaction of ATM users at BK and competitive market, advertisement and increase ATM services are strategies to optimize the usage of ATM at BK. Also it has been confirmed that there is a significant relationship between ATM and profitability at the BK.

Keywords: *automated teller machines, profitability, commercial bank.*

GJMBR-C Classification: *JEL Code: E59*



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The Automated Teller Machines and Profitability of Commercial Banks in Rwanda

Jean Bosco HARELIMANA

Abstract- A study on Automated teller machines (ATM) and profitability of commercial bank was conducted in this paper under a period from 2010 to 2016 with the aim of assessing the use of ATM and its contribution to the profitability in bank of Kigali. Quantitative and qualitative Methods of data collection were employed including questionaires in collecting primary data. The total population was 334,121 ATM users at BK where a sample of 200 respondents were used. The findings have shown that in Bank of Kigali still faces an obstacle on lack of financial education (information, training…) of the customers about how to use ATM cards in general. The evolution of the profitability shows that the profitability of the Bank of Kigali remained intact with, ROA, ROE and net margin of 4.0%, 22.9% and 9.9%, respectively in 2014. 4.0%, 22.2%, 11.1% in 2013. When the correlation of variables is < 0.5 the hypothesis is rejected when the correlation of variables is > 0.5, therefore the hypothesis confirmed that there is a significant relationship between automated teller machines and profitability of Bank of Kigali where the finding shows that the correlations between ATM and ROA, ROE and net margin are > 0.5. Lower cost, differentiation and accessibility are factors determinants level of satisfaction of ATM users at BK and competitive market, advertisement and increase ATM services are strategies to optimize the usage of ATM at BK. Also it has been confirmed that there is a significant relationship between ATM and profitability at the BK. It is recommended to invest in ATM usage for the accessibility of the services of Bank of Kigali to be competitive on the market and finally to be sustainable on the market.

Keywords: automated teller machines, profitability, commercial bank.

I. Introduction

Queues have always been a big problem for banks and building societies. Rwanda community needed a quick service delivery by avoiding to spend time on queue in banking hall. Thus the automated teller machine was introduced to avoid those queue. The study is intending to help the bank user to understand how important the ATMs are in increasing and quick services delivery.

An ATM is a computerized telecommunication device that provides the customer of a financial institution with access to financial transactions in a public space without the need for a human cashier, clerk or bank teller (Cronin and Mary, 1997).

Queues are bad news for customers. Most of banking institutions in Rwanda have introduced the use of ATM cards but the problem of long queues of customers who need services is still appearing at the banking hall instead of using ATMs. In the banking industry, the adoption of technology has become the norms as way of securing a competitive edge in the electronic age. Both companies and researchers are becoming increasingly aware of the importance of technology on service delivery and in a business' overall success (Meuter et al.,2000). The evolution of payments in recent history has gone from cash to cheques, and then to payment cards such as credit cards and debit cards (Batiz, 2005). For-profit organizations are in operation to make money and are typically referred to us as businesses. An organization might employ various strategies for generating a profit. If a clothing business spends less money stocking merchandise than it receives selling merchandise, this is considered profitable.

In order to remain competitive, most companies invest a lot of money in modern ICT infrastructure. A number of studies have concluded that ICT has appreciable positive effects on banks productivity; banking hall teller transactions, bank patronage and bank service delivery (Balachandler et al, 2001; Yasuharu, 2003). The ATM is no exception to the numerous ICT products. The ATM services have gone through many stages. According to Abor (2004), the ATM was first introduced solely as a cash dispensing machine but it can now perform other banking services such as cash withdrawals, funds transfers from one account to the other and the payment of bills.

Normally, the objective of any financial institution is to provide rapid and effective services to its clients. In Rwanda, Commercial Banks introduced the system of ATMs as a means of payment to hasten increased services delivery to their clients. However, one wonders if the ATMs in Rwandan commercial banks have delivered to their expectations in facilitating rapid and effective services. It is under this background that the researcher is interested in this study.

The study will be focused on the following hypothesis:

- Lower cost, differentiation and accessibility are the satisfaction factors of ATM card users atthe Bank of Kigali.
- Competitive market, advertisement, and increase ATM services are strategies to optimize the usage of the ATM card to avoid queues at the Bank of Kigali.

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- There is a positive significant relationship between automated teller machines and profitability of Bank of Kigali.

II. Research Objectives

The purpose of this study is to assess the use of ATM and its contribution to the profitability in bank of Kigali, Rwanda. Specifically, the studyintend.

- ✓ To find out the level of satisfaction of ATM card users at the Bank of Kigali.
- ✓ To determine strategies to optimize the usage of the ATM card to avoid queues at the Bank of Kigali.\
- ✓ To identify a significant relationship between automated teller machines and profitability of Bank of Kigali.

III. Methodology

In this section tools and techniques and methods had been used to achieve research objectives of this study. Both primary and secondary data were collected then analyzed through SPSS.

a) Data

The study is descriptive which is employing quantitative methods of data collection and analysis. The population under this study consisted of 334,121 potential respondents who are holding the ATM cards at the Bank of Kigali. By applying Yamane formula, a sample of 200 ATM users from 334,121 has been chosen. The sample period undertaken for the objective of this study is for from 2010 to 2014.

b) Reseach Instruments

The study used both primary and secondary data to collect data. Questionnaires, interview and observations was made on 200 populations for the obtention of primary data. Various published text such as textbooks, web publications, magazines, journals and internet was consulted to obtain secondary data. Gathering data from written resources concerning research topic was made in order to understand the present situation.

c) Models and Techniques

To interpret the responses of the respondents, the following qualification of interpretation were used:

Meanranges	Interpretations
3.26-4.00	Very low
2.51-3.25	Low
1.76-2.50	Moderate
1.00-1.75	High

To explain the relationship between Effect of Automated teller machines on the profitability of commercial banks, the following formula showing the factors of independent variable has been used:

$$Y1 = \beta 0 + \beta 11NCA + \beta 21CSA + \beta 31ASA + \varepsilon$$

To explain the relationship between Automated teller machines on the profitability the following the following formula showing the factors of dependent variable has been used:

$$Y2 = \beta 0 + \beta 12LCS + \beta 22DP + \beta 32AATM + \varepsilon$$

Where β0 is the coefficient constant, ε is the error term β1, β2, β3 and β4 are the coefficients of variables and the variables of the study were Y1 is representing the independent variable, and Y2 is representing dependent variable (Y1 as ATM and Y2 as profitability).

IV. Literature Review

Bankley et al. (2006) cited in Musara and Fatoki (2010) opine that technology provides enhanced insight into handling old and new tasks. Technology has changed not only the way we do business but has also changed virtually all sphere of human life. Abor (2005) affirms that technology affects even the direction of an economy and its capacity for continued growth. Human beings consciously or unconsciously interact with products of technology in almost all their daily activities. These products have made the performance of activities which hitherto were carried our stressfully and unproductively much more convenient, faster, easier and more accurate.

According to Aldajani and Alfares (2009), Automated Teller Machines are among the most important service facilities in the banking industry. In the banking industry, information and communication technology is playing a major role in addressing operational challenges such as quicker exchange of data, information processing, record storage and retrieval and many more. The Automated Teller Machine (ATM) is one of the several electronic banking channels used in the banking industry.

In Rwanda, ATM as a banking instrument has enjoyed widespread acceptance and usage. In a survey conducted by Abor (2005), more than half of respondents revealed their preference for ATM as a conduit to conducting transactions. ATMs particularly when installed off-site serve to keep customers away from bank halls. Unfortunately most ATMs in Ghana are on-site operating very much as another department of the bank.

The issue of queue control in bank halls via ATM is essentially defeated because ultimately access to these facilities is limited to customers going to the bank. ATMs themselves have as a result become subjects of large service demands which directly translate to queues for services when these demands cannot be quickly satisfied. This situation becomes compounded and more evident during festive periods and month endings, around which time demand for cash is high.

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(Abaenewe Z.C et al., 2013) in their research on Electronic banking and bank performance in Nigeria investigated the profitability performance of Nigerian banks following the full adoption of electronic banking system. The study became necessary as a result of increased penetration of electronic banking which has redefined the banking operations in Nigeria and around the world. Judgmental sampling method was adopted by utilizing data collected from four Nigerian banks. These four banks are the only banks in Nigeria that have consistently retained their brand names and remain quoted in the Nigerian Stock Exchange since 1997.

The study revealed that the adoption of electronic banking has positively and significantly improved the returns on equity (ROE) of Nigerian banks. On the other hand and on the contrary, it also revealed that e-banking has not significantly improved the returns on assets (ROA) of Nigerian banks. The findings of this study have motivated new recommendations for bank customers, bank management and shareholders with regard to electronic banking adoption for banking operations.

LukwiyaBenard Osteen (2011) in his research conducted in Uganda on the effect of automated teller machine use on customer satisfaction in banking found that the respondents rated the services offered by an ATM to be effective with withdrawal as the main service offered by ATM, followed by checking of balances, while the statement/mini statement of account came third, and Cash or cheque deposit came last. The finding further depicts that more than half of the respondents were satisfied by the services offered by the ATM. This study thus shed light on the awareness of the ATM services to nature evident results in customer satisfaction in society and as a view point for banking industry by showing how quality services offered by ATM service points are essential and its relationship to customer satisfaction.

Omari, Richard KwakuBamfo (2012) in his research onAssessment of the use of Automated Teller Machine (A.T.M) of Barclays Bank Ghana Limited AkimOda Branch concluded that majority of ATM subscribers have a good knowledge on the services offered by the branch ATM. The motivating factors for using the branch ATM services are privacy in carrying out banking transactions, time saving element and the flexibility in use. The demotivating factors that prevented respondents from using the branch ATM are high charges, technical failures and unfavorable daily withdrawal.

During this study, the researcher could not find the study carried on ATM cards and profitability in Rwandan banking industry. However, by observation, many banks in Rwanda have introduced the use of ATMs and that is the main reason which pushed the researcher to choose this topic to find out whether customers are satisfied with ATMs and identifying the contribution of ATMs to the profitability of commercial banks.

V. Findings and Results

The aims of this section is to analyzing; presenting and interpreting the data collected through primary and secondary data sources administered to automated teller machines on profitability of Bank of Kigali.

The findings show that male is 55% of total number of respondents and 45% of total number of respondents which shows gender balance in this paper. From findings, 10% of total number of respondents have below 20years, 22% of total number of respondents have between 21-28 years, 36% have between 29-36 years, 16% of total number of respondents are between 37-44 years and 16% have 45 years and above. The table 3 shows that 15% of total number of respondents has primary school, 52% of total number of respondents has secondary school, and 33% of total number of respondents has university.

The findings show that the respondents are in all categories.The gender distribution of the respondent reveals that majority of the respondents were male that is to say 55(55%) and minority respondent were females 45(45%). these two figures therefore justify almost gender balance in this study. The age distribution of respondents is as follows; 10% of total number of respondents have below 20years, 22% of total number of respondents have between 21-28 years, 36% have between 29-36 years, 16% of total number of respondents are between 37-44 years and 16% have 45 years and above. It can therefore be deduced that through all age categories were represented the youth respondents almost monopolized the study. The findings indicate that 15% of total number of respondents have primary school, 52% of total number of respondents have secondary school, and 33% of total number of respondents have university.

As shown by the reults, 100% of total number of respondents agreed that they hold an account in Bank of Kigali which shows that all respondents have accounts in Bank of Kigali. The findings show that 32% of total number of respondents agreed that they have been educated on utilization of ATM cards and 68% of total number of respondents agreed that they have never been educated on utilization of ATM cards which shows that a big number of respondents have never gotten any training on utilization of ATM card.

The findings shows that 84% of total number of respondents agreed that they have gotten a positive influence of ATM on service delivery, and 16% of total number of respondents agreed that there is no a positive influence of ATM on service delivery which shows that ATM card has influence on BK service delivery. From results, 76% of total number of

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respondents agreed that they use to go to the queue before accessing the ATM bank services, and 24% of total number of respondent agreed that they didn't use to go to the queue before accessing the ATM bank service, means that the ATM card influenced the reduction the queue.

The findings in terms of lower cost shows that 10% of total number of respondents agreed that they are in high level of satisfaction, 36% of total number of respondents agreed that they are in middle level of satisfaction, 25% of total number of respondents are neutral, and 29% agreed that they are in low level of satisfaction, and the mean range interpretation shows that the level of satisfaction is low. The findings in terms of differentiation shows that 40% of total number of respondents agreed that they are in high level of satisfaction, 32% of total number of respondents agreed that they are in middle level of satisfaction, 18% of total number of respondents are neutral, and 10% agreed that they are in low level of satisfaction, and the mean range interpretation shows that the level of satisfaction is moderate. From the same table in terms of accessibility shows again that 25% of total number of respondents agreed that they are in high level of satisfaction, 22% of total number of respondents agreed that they are in middle level of satisfaction, 34% of total number of respondents are neutral, and 19% agreed that they are in low level of satisfaction, and the mean range interpretation shows that the level of satisfaction is low. The total mean range is moderate which needs to be improved.

Results show that the mean of overall price related differential is 1.134, coefficient of dispersion is 0.258 and overall of coefficient of variation and median centered is 34.7% which shows that the level of satisfaction of respondents of ATM card is low and it needs to be improved. The results show that level of satisfaction is low with mean range of 2.6370, standard deviation of 0.988 and mean square of -913 which shows that the level of satisfaction of respondents is low and needs to be improved.

Results show that the overall price related differential is 0.992, the coefficient of dispersion is 0.055 and coefficient of variation and median centered is 15.9 %= 16% which shows that level of strategies to optimize the usage of the ATM card to avoid queues at BK is low.

The results about the strategies to optimize the usage of ATM card to avoid queues at BK shows that the competitive market is has mean range of 1,9726 which is moderate, advertisement has mean range of 1,9041 which is moderate and increase ATM services has mean range of ,6712 which is high. The table 15 shows that the profitability of the Bank of Kigali remained intact with, ROA, ROE and net margin of 4.0%, 22.9% and 9.9%, respectively in 2014. 4.0%, 22.2%, 11.1% in 2013, etc….

Results show that high level of lower cost strategy is 45% of total number of respondents, middle level of lower cost strategy is 32% of total number of respondents, and low level of lower cost strategy is 23% of total number of respondents, which shows that Bank of Kigali needs to do more reduction of ATM charges to make all customers to afford usage of ATM cards.

Findings show that high level of differentiation is 36% of total number of respondents, middle level is 35% of total number of respondents, and low level is 29% of total number of respondents which shows that Bank of Kigali needs more innovation.

Results show that high level of accessibility is 42% of total number respondents, middle level of accessibility is 32% of total number of respondents and low level of accessibility is 26% of total number of respondents. Bank of Kigali needs more ATM branches.

Results show that mean range of lower cost strategy is 1.7534 which is high, mean range of differentiation is 1.7055 which is high, and mean range of accessibility is 1.7123. The findings shows that total mean of profitability is high with 1.1392 and it always need to be improved for sustainability of commercial bank.

Results show that in Bank of Kigali Board, Pearson correlation about ATM cards have a positive contribution to the increase of commission fee income is 1, about ATM cards have a positive contribution in increasing the interest income is 0.893, and about ATM cards open new potential of income generation and help in reducing operating expenses in BK is 0.838. The findings show that in Bank of Kigali staffs Pearson correlation about ATM cards have a positive contribution to the increase of commission fee income is 0.893, about ATM cards have a positive contribution in increasing the interest income is 1, and about ATM cards have a positive contribution in increasing the interest income is 0.748, and it shows again that in Bank of Kigali customers Pearson correlation about ATM cards have a positive contribution to the increase of commission fee income is 0.838, about ATM cards have a positive contribution in increasing the interest income is 0.748, and about ATM cards open new potential of income generation and help in reducing operating expenses in BK 1. When the correlation of variables is < 0.5 the hypothesis is rejected when the correlation of variables is > 0.5, therefore the hypothesis confirmed that there is a significant relationship between Automated teller machines and profitability of Bank of Kigali.

The findings show that in Bank of Kigali Board, Pearson correlation about ATM cards increase the net margin by its positive net income is 1, about the payback period in ATM cards does not exceed 3 years is 0.903, and about ATM cards reduce the operational costs and thus contribute positively to the ROA of BK is 0.919. The table shows that in Bank of Kigali staffs

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Pearson correlation about ATM cards increase the net margin by its positive net income is 0.903, about the payback period in ATM cards does not exceed 3 years is 1, and about ATM cards reduce the operational costs and thus contribute positively to the ROA of BK is 0.829, and it shows again that in Bank of Kigali customers Pearson correlation about ATM cards increase the net margin by its positive net income is 0.919, about the payback period in ATM cards does not exceed 3 years is 0.829, and about ATM cards reduce the operational costs and thus contribute positively to the ROA of BK is 1. When the correlation of variables is < 0.5 the hypothesis is rejected when the correlation of variables is > 0.5, therefore the hypothesis confirmed that there is a significant relationship between automated teller machines and profitability of Bank of Kigali.

The findings show that in Bank of Kigali Board, Pearson correlation about ATM cards induce positively the fast turnover of the total assets of BK is 1, ATM cards contribute positively to an increase of indebtedness of BK vis-a-vis their shareholders is 0.660, and about ATM cards contribute positively to the operating profit margin by its specific features is 0.543. The table shows that in Bank of Kigali staffs Pearson correlation about ATM cards induce positively the fast turnover of the total assets of BK is 0.660, ATM cards contribute positively to an increase of indebtedness of BK vis-a-vis their shareholders is 1, and about ATM cards contribute positively to the operating profit margin by its specific features is 0.824, and it shows again that in Bank of Kigali customers Pearson correlation about ATM cards induce positively the fast turnover of the total assets of BK is 0.543, about ATM cards contribute positively to an increase of indebtedness of BK vis-a-vis their shareholders is 0.824, and about ATM cards contribute positively to the operating profit margin by its specific features is 1. When the correlation of variables is < 0.5 the hypothesis is rejected when the correlation of variables is > 0.5, therefore the hypothesis confirmed that there is a significant relationship between automated teller machines and profitability of Bank of Kigali.

a) Profile of Respondents

Due to the first objective of this study, the results on this objective indicate that, the gender distribution of the respondent reveals that majority of the respondents were male that is to say 55% and females of 45%. These two figures therefore justify almost gender balance in this study.

The age distribution of respondents is as follows; 10% below 20, 22% (21-28), 36 % (29-36), 16 %(37-44), 16% 45 above. It can therefore be deduced that through all age categories were represented the youth respondents almost monopolized the study. The table indicates that 15% of respondents who has primary school, 52% of the respondents who has secondary and 33% who has university.

b) Knowledge of respondents on ATM services

The findings shows that the majority of respondents with 84% of total number of respondents agreed that they hold an account in Bank of Kigali, majority of respondents with 58% of total number of respondents agree that they possess an ATM cards, the majority of respondents with 68% of total number of respondents agreed that they have never been educated on utilization of ATM cards, the majority of respondents with 76% of total number of respondents agreed that they use to go to the queue before accessing the ATM bank services.

c) The level of satisfaction of ATM card users at the Bank of Kigali

The findings shows that the majority of respondents with 36% of total number of respondents agreed that they are in high level of satisfaction of ATM card services, the majority of respondents with 40% of total number of respondents strongly agreed that they are in middle level of satisfaction, the majority of respondents with 34% of total number of respondents disagreed that they are in low level of satisfaction, and total mean interpretation is moderate. This shows that the majority of respondents are satisfied with ATM card services.

d) Strategies to optimize the usage of the ATM card to avoid queues at the Bank of Kigali

The findings shows that with 37% of total number of respondents strongly agreed that the competitive market strategy is a strategy to optimize the usage of the ATM card to avoid queues, the majority respondents with 38% of total number of respondents strongly agreed that advertisement strategy is a strategy to optimize the usage of the ATM card to avoid queues, the majority of respondents with 52% of total number of respondents strongly agreed that increase ATM services strategy is a strategy to optimize the usage of the ATM card to avoid queues, and total mean interpretation is moderate. This shows that competitive market, advertisement, and increase ATM services are the good strategies to optimize the usage of the ATM cards.

e) Relationship between Automated teller machines and the profitability

The results shows that in Bank of Kigali Board, Pearson correlation about ATM cards have a positive contribution to the increase of commission fee income is 1, about ATM cards have a positive contribution in increasing the interest income is 0.893, and about ATM cards open new potential of income generation and help in reducing operating expenses in BK is 0.838. The table shows that in Bank of Kigali staffs Pearson correlation about ATM cards have a positive contribution to the increase of commission fee income is 0.893, about ATM cards have a positive contribution in increasing the

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The findings shows that in Bank of Kigali Board, Pearson correlation about ATM cards increase the net margin by its positive net income is 1, about the payback period in ATM cards does not exceed 3 years is 0.903, and about ATM cards reduce the operational costs and thus contribute positively to the ROA of BK is 0.919. The table shows that in Bank of Kigali staffs Pearson correlation about ATM cards increase the net margin by its positive net income is 0.903, about the payback period in ATM cards does not exceed 3 years is 1, and about ATM cards reduce the operational costs and thus contribute positively to the ROA of BK is 0.829, and it shows again that in Bank of Kigali customers Pearson correlation about ATM cards increase the net margin by its positive net income is 0.919, about the payback period in ATM cards does not exceed 3 years is 0.829, and about ATM cards reduce the operational costs and thus contribute positively to the ROA of BK is 1.

Also the findings shows that in Bank of Kigali Board, Pearson correlation about ATM cards induce positively the fast turnover of the total assets of BK is 1, ATM cards contribute positively to an increase of indebtedness of BK vis-a-vis their shareholders is 0.660, and about ATM cards contribute positively to the operating profit margin by its specific features is 0.543. The table shows that in Bank of Kigali staffs Pearson correlation about ATM cards induce positively the fast turnover of the total assets of BK is 0.660, ATM cards contribute positively to an increase of indebtedness of BK vis-a-vis their shareholders is 1, and about ATM cards contribute positively to the operating profit margin by its specific features is 0.824, and it shows again that in Bank of Kigali customers Pearson correlation about ATM cards induce positively the fast turnover of the total assets of BK is 0.543, about ATM cards contribute positively to an increase of indebtedness of BK vis-a-vis their shareholders is 0.824, and about ATM cards contribute positively to the operating profit margin by its specific features is 1 When the correlation of variables is < 0.5 the hypothesis is rejected when the correlation of variables is > 0.5, therefore the hypothesis confirmed that there is a significant relationship between Automated teller machines and profitability of Bank of Kigali.

To conclude, we remind you that purpose of the study is to assess the effect of Automated teller machines on the profitability of commercial banks in Rwanda especially in Bank of Kigali. The findings shows that the majority of respondents hold the ATM card and small number of them got trainings in usage of them. Therefore Bank of Kigali needs to improve the level of trainings is giving to their customers. The finding shows that there is a positive influence of ATM on service delivery because the majority of responds agreed they use to go to the queue before they assess ATM cards. Therefore Bank of Kigali needs to improve their services in terms customers satisfaction. The finding shows that the level of satisfaction of ATM card users at the Bank of Kigali is moderate witch needs to be improved. The finding shows that the level ofstrategies to optimize the usage of the ATM card to avoid queues at the Bank of Kigali is moderate which needs also to be improved.

Based on findings and result, it is recommend:

- ✓ To the Government of Rwanda; to bould the financial education infrasture to the Rwandan population in order to be familiar with the new technologies like Automated teller machines to promote the financial services accessibility of getting money without queue which will contribute to the profitability of financial Institutions in Rwanda.
- ✓ To the local community; they should understand the effect of Automated teller machines in its true meaning. Local community should identify the need to respond to changing circumstances and increased understanding by adapting the new system of automated machines so that it will be more likely to achieve its intended impacts.

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