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Effects of Payment Cards on Financial Performance of Commercial Banks in Kenya

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Abstract

Since 2009, Kenya's financial system has experienced remarkable financial innovation with possible implications on financial performance of commercial banks in Kenya. Increase in financial literacy in Kenya has increased the use of payment cards and also infrastructural expansion of commercial banks led to increase in the number of points of sales. However, later with the adverse effect of financial crisis since 2008, most banks were forced to close down some of their branches and points of sales as a cost cutting measure, some became victims of mergers and acquisitions. This led to decrease in the number of payment card transactions. Though ATMs have contributed a lot in improving the efficiency of banking to customers, they have a high fixed and maintenance cost. The study sort to establish the relationship between payment cards and financial performance of commercial banks in Kenya. Cross-sectional descriptive survey research design was used. The population of this study was 42 commercial banks licensed by the Central bank of Kenya from 2011 to 2020. The study used secondary data obtained from the 42 banks' annual financial reports for a ten years' time period from 2011 to 2020. The study was guided by Coase Theorem, Constraint Induced Financial Innovation Theory, Circumvention Innovation Theory and Innovation Diffusion Theory. Data was analysed using descriptive statistics and panel model. The results indicate that Debit card on ATM had a positive significant relationship with ROA at 5% significance level. The Credit Cards on ATM and POS Machines were also positively related to ROA but were not statistically significant while Prepaid Cards ATM was negatively related to ROA and non-significant. The study recommends that commercial banks should continue investing in innovation delivery channels because they are able to control their costs much better as compared to investment on physical branches. The findings contributed to new knowledge to literature and theory.

Keywords: *Payment cards, Financial performance, Commercial banks*

1.0 Introduction

Commercial banks are an important feature in every stable economy in the world. Financial intermediation is the greatest role played by commercial banks. It includes, the movement of funds from lenders to borrowers and matching sellers and buyers indirectly through the process of financial asset transformation thus acting as vehicles of investment of savings, extension of credit and risk management. Banks help in diversification of risks and reduce substantially transaction cost due to their developed expertise and economies of scale. They are also main actors in financial inclusion by providing payment services and financial products that enable households and firms to participate in the broader economy. According to Adam Hayes (2020), virtually everyone living in a developed economy has an ongoing or at least periodic need for the services of financial institutions. Beyond the intermediation function, the financial performance of commercial banks has critical implications for economic growth of countries.

According to IMF (2018), the year 2019 marked a decade since the peak of the global financial crisis in 2009. Since then, the global banking system has been significantly strengthened through global regulatory reform measures. These measures have resulted in stronger capital and liquidity buffers which was informed by the continued influence of technology in the banking sector. Commercial Banks scaled up partnerships with Fintechs and Bigtechs to leverage their agility in the new age of technology. On the risk frontier, technology presented new opportunities for banks to leverage on to identify and mitigate emerging risks, particularly cyber-security

According to European Commercial Bank (2003), the definition of financial innovation is described as a factor which creates cost reduction in a product and the organization which are mainly banks or other service sector. According to Mwangi, (2013) there are three types of financial innovations: institutional innovation, process innovations and product innovations. Institutional innovations relate to changes in banking structures, establishment of new types of financial intermediaries like agency banking, and changes in the legal and supervisory framework. Process innovations covers the introduction of new business processes leading to increased efficiency, market expansion and client data management. These may include electronic banking, automated teller machines (ATMs), and Real Time Gross Settlement (RTGS). Product innovations include the introduction of goods or service with improved characteristics to respond to changes in market demand or to improve the efficiency. These may include new credit cards, personal unsecured loans, money transfer services, and mobile banking. Financial Innovations are much more efficient than payment systems based on paper, because it reduces the cost of collection, storage, processing, and transmission of information, increase accessibility and financial inclusion. Financial innovation aspects have been implemented by diverse commercial banks across the globe.

Declining rate of profits of commercial banks have forced some to move out of the market and most getting into merger acquisition deals. This is evident by heightened mergers and acquisitions over the past years like National Bank, Fidelity Bank, CBA and NIC Bank which was motivated by the need to enhance revenue growth, optimize its operations and scale for growth. With the declining financial performance and integration of country's banking sector with the rest of the world, the concept of banks and banking has undergone a paradigm shift. Before financial reforms, commercial banks were enjoying a protected environment with a strong cushion of the government and this made them operationally inefficient. However, with deregulation and foreign banks access to local market; banks had

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to look for strategies of earning more profits, increase efficiency and easy accessibility to the market. Financial innovations happened to be the only way out.

Financial innovations have been used by commercial banks as formidable strategic variables to outstrip any form of competition thus becoming an effective means by which banks can improve their performance while simultaneously being able to maintain their effectiveness in the market (Ahmed *et.al.* 2019). According to Noyer (2007), financial innovation has not only opened up new opportunities for the sector participants, but also increased new market players arising from new products in the financial market.

2.0 Statement of the Problem.

According to CBK (2019), payment cards include credit, debit and prepaid cards, which hold a strong foothold not only in Kenya but globally, offering everyone better access to their money. ATMs machines and POS terminals provide services for 24 hours and therefore customers are able to access them any time when they have a need. They are faster as compared to human teller and easy to use them (Jegede, 2014). The banking sector continues to adopt more secure, convenient and safe technology at their cash points to curb insecurity and at the same time enlighten their customers. In 2013, the industry, through the 'Great Migration to EMV Chip' project, initiated shifting from magnetic strip based cards to chip enabled cards. This process improved the security of cards and ensured they are globally interoperable, thus further increasing their uptake. These cards are normally transacted through the ATMs or Point of Sale Terminals.

Increase in financial literacy in Kenya has increased the use of ATMs and also infrastructural expansion of commercial banks led to increase in the number of points of sales. However, later with the adverse effect of financial crisis evident in the last few years most banks were forced to close down some of their branches and points of sales as a cost cutting measure, some became victims of mergers and acquisitions resulting to a decrease in the number of payment card transactions. According to Central Bank of Kenya (2015), the number of ATMs increased from 2,205 in 2011 to 2,718 in 2015 even though the increases per year were a bit low. In addition, the bank's annual banking industry reports indicate that there has been a decreasing trend in ratio of ATM to the number of branches from 1.899 in 2011 to 1.785 in 2015. According to Supervisory Bank Report 2020, the number of ATMs decreased by 70 (2.77 percent) to 2,459 in December 2019 from 2,529 in December 2018. Though ATMs have contributed a lot in improving the efficiency of banking to customers, they have a high fixed and maintenance cost (Danlami & Mayowa, 2014).

However, with the onset of COVID 19 pandemic, payment cards proved to be the safest option of payment to reduce the movement of money from one person to another, thus curbing the spread of the virus. The extent to which this payment cards have affected financial performance of commercial banks before COVID 19 onset and after needs to be quantified to aid in policy formulation and forecasting with a view to enhance the financial performance of commercial banks in Kenya and enable the sector to perform its important role in the economy.

Whereas there is some theoretical literature on the effects of ATM banking on financial performance, little empirical evidence exists on payment cards relationships with financial performance particularly in Kenya. Previous studies have mainly focused on ATM cards on ATM machines but left out ATM cards, debit cards and credit cards on point of sales terminals which is currently the main option of payment. Studies done have shown varied findings some indicating a positive effect Adewoye and Omoregie (2013), Ngango and Shukla (2015), Ndung'u (2011), Kamau & Oluoch, (2016), Edoka & Anyanwaokoro, 2019)

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and some indicating a negative effect (Mustapha, 2018, Ngumi, 2013, Kamande, 2018). The mixed findings witnessed in the previous studies may be attributed to the method of data analysis where most of these studies used pooled panel data which treats the entities under the study to be homogenous yet in practice they are not. To address this problem this proposed study was use fixed effect or random effect model as was being determined by Hausman test. This study therefore sought to ascertain the current position of payment cards and its contribution on the financial performance of commercial banks in Kenya.

2.0 Literature

In Nigeria, Mustapha, (2018) undertook a study that sought to examine the influence of electronic payment technology on bank performance aspects. Mustapha, (2018) found that the ATM is one of the commonly used electronic payment technology in Nigeria and was negatively associated with the performance of the banks. The negative relationship was attributed to the costs associated with physical mounting of ATM machines and the costs of acquisition and operating of the ATM locations. The costs associated with the ATM operations are high compared to other channels utilized in the provision of cash services. This negatively impacts on the bank performance aspects.

Adewoye and Omoregie (2013) noted that use of ATMs and debit cards led to cost efficiency measured in terms of cost-to-income ratio and asset management rate in commercial banks in Nigeria. Their study used secondary data involving a sample of 22 commercial banks to recommend the continued deployment of ATMs and debit cards by commercial banks to improve overall efficiency. Given that the study was conducted in Nigeria, it would be important to conduct a similar study on ATMs and debit cards in a different context. This study was therefore conducted for comparison purposes necessitated by contradicting findings regarding the effects of ATMs and debit cards on institutional performance.

In another study on electronic banking and the performance of commercial banks, Ngango, Mbabazize, and Shukla (2015) found that electronic banking systems like ATMs, pay direct, electronic check conversion, mobile telephone banking, and electronic transactions had a great impact on bank performance due to increased profitability, reduced operation costs, and increased assets and efficiency. Their study however employed a weak descriptive research design by basing it on qualitative and quantitative approaches to data collection. This study was based on both descriptive and explanatory research designs to improve validity of the results.

Ndung'u (2011) analysed the impact of mobile phone money in Kenyan banking industry between 2007 and 2011. The study found that mobile banking services has resulted to reduced transaction costs and greatly increased access to banking services in Kenya hence improved performance in the sector. Moreover, a survey done by Central Bank in 2008 shows a steady increase in the consumption of e-banking techniques such the ATM, EFT, online banking, mobile bill payments and credit card utilisation in the Kenyan market (CBK, 2008)

Ngumi (2013) found that debit cards were not statistically significant towards improving the financial performance of banks due to their association with fraud incidences, causing financial institutions to incur losses. However, Jegede (2014) found that the deployment of ATM terminals had on average improved the performance of Nigerian banks despite the alarming rate of ATM fraud. Given the fraud incidences associated with the use of debit cards to perform banking transactions on ATMs, it was worth investigating the effect of these ATMs and debit cards on SACCOs' performance.

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Automated Teller Machines (ATM) is a component of the financial innovation that is associated with the financial performance of commercial banks. According to Manjushree, (2020) the ATM refers to the self-service vendor machines that enable the bank's customers to be able to undertake diverse banking functions including cash deposit, cash withdrawal, balance checking, statement request amongst other aspects. The ATMs has been associated with improved Financial performance of Commercial Banks through reduction of cost of service provision and increase in transactional revenues (Kamau & Oluoch, 2016; Edoka & Anyanwaokoro, 2019).

The ATM banking influence on the financial inclusion has a consequent influence on the financial performance of Commercial Banks. Employing descriptive research design, Kithinji, (2017) undertook a study that sought to examine digital banking on the financial inclusion amongst the commercial banks in Kenya. The study found that the investment levels in the ATM banking improve access to the banking services amongst the unbanked population. The study thus concluded that ATM banking had a positive and statistically significant influence on the financial inclusion amongst the commercial banks in the country. The financial including has been found by diverse studies to have a mediating influence on the financial performance of commercial banks. Studies that have found a link between the financial inclusion and Financial performance of commercial banks include (Kinyua & Omagwa, 2020) in respect to listed commercial banks, and (Shankar, 2016) in respect to the commercial banks in India.

Similar to Kithinji, (2017), Kamande, 2018) examined the influence of electronic banking on the financial performance of commercial banks in Kenya. The study used the descriptive cross sectional research design and collected data from a sample size of 42 commercial banks. Amongst the aspects of electronic banking that was examined included the ATM banking components. While noting the role of ATMs in the improvement of the financial inclusion and financial performance of commercial banks, (Kamande, 2018) however noted that the mobile and internet banking are increasingly being preferred amongst the bank customers. The ATM banking as measured using the ATM banking transactions was found to have statistically insignificant positive correlational relationship with financial performance. Kamande, (2018) further found that ATM banking had a statistically insignificant predictive influence on the Return on Assets (ROA) within the commercial banks.

3.0 Methodology

This study focused on cross-sectional descriptive survey design. The population of this study was 42 commercial banks licensed by the Central bank of Kenya from 2011 to 2020. This was a census study and consequently there was be no sampling. The study used secondary data obtained from the 42 banks' annual financial reports for a ten years' time period from 2011 to 2020. Data collected was checked for missing values, extreme values, errors and inconsistency as part of data cleaning. This involved the use of Histograms and Box plots to aid in data visualization with aim of detecting abnormalities. Data was analysed using descriptive statistics, and panel model. Results of the analysis were presented through percentages, means, standard deviations and frequencies using tables.

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4.0 Results and Discussions

The data used in this study was for the 42 commercial banks in Kenya for the period between the period 2009 to 2020. It was collected from the Central Bank of Kenya (CBK) website https://www.centralbank.go.ke/. The main variables of interest were the return on assets (ROA), the value of Prepaid Cards on ATMs in (Ksh. '000,000) abbreviated as Prepaid Cards on ATM, the value of credit cards used on ATMs in (Ksh. '000,000) abbreviated as Credit Cards on ATM, the value of debit cards used on ATMs in (Ksh. '000,000) abbreviated as Debit Cards on ATM and the value of all payment cards used in Point of Sale Machines in (Ksh. '000,000) abbreviated as POS Machines. The data cleaning was done by checking for missing values, inconsistency and outliers and then addressed appropriately before downstream analysis.

Descriptive Statistics

The preliminary analysis of the data involved the examination of the descriptive statistics as shown in Table 1.

Table 1: Descriptive Statistics

	Mean	SD	Median	Min	Max	Skew	Kurtosis	SE
ROA	3261610.68	1273570.85	3346019.5	1389645.00	5405746.00	0.09	-1.09	367648.24
avROA	77657.44	30323.17	79667.13	33086.79	128708.24	0.09	-1.09	8753.54
PrepaidCardATM	97.15	62.36	66.44	43.40	248.55	1.02	0.16	18.00
CreditCardsATM	721.53	364.46	628.70	310.83	1406.25	0.43	-1.27	105.21
DebitCardsATM	37405.94	9307.45	34939.96	24430.17	57339.73	0.96	-0.15	2686.83
POSMachines	7911.84	3682.28	8022.58	2592.67	14916.91	0.38	-0.99	1062.98

The results indicate that on average the value of debit cards used on ATMs was the highest followed by the value of all payment cards used in Point of Sale Machines while the smallest was the value of Prepaid Cards on ATMs. This points out that the ATMs are mostly used with the debit cards and least used with the prepaid cards. The Skewness statistic and kurtosis statistic obtained for the variables of interest in this study were in the range 0.09-1.02 for Skewness and -1.09-0.16 for kurtosis.

Value of Debit cards on ATM and value of all cards on POS machine have relatively larger variation compared to the other variables. Value of Debit cards on ATM ranges between 57339.73 to 24430.17 value of all cards on POS machine ranges from 2592.67 to 14916.91. This means that value of Debit cards on ATM has relatively high volatility compared to other variables hence most likely to affect financial performance. This may be attributed to 24

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hours' access to ATMs by customers and recent shift from magnetic strip based cards to chip enabled cards. This process improved the security of cards and ensured they are globally interoperable, thus further increasing their uptake.

Further analysis was done by data visualization of the four variables of interest using multiple time plots. The result is presented in Figure 1.

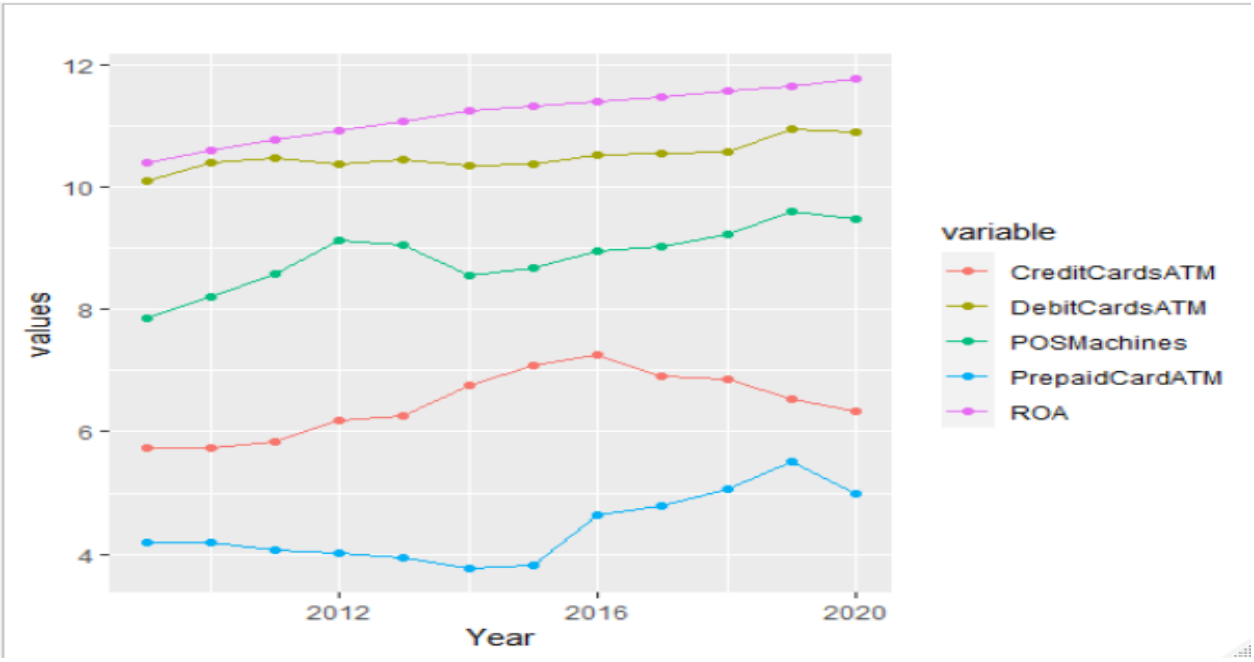

Figure 1: Trend Lines for Key variables of the study

Figure 1 reveals that all the four variables in general show an increasing trend from 2009 to 2020 except the POS machine which has a downward trend from 2016 to 2020. It is worth noting that ROA is in general higher than all of them which could be attributed to embracement of technological advancement by commercial banks to increase their efficiency and attract more profits while the Prepaid Cards on ATM is the lowest. This could be explained by the fact that prepaid card are not linked to a personal banking account, meaning there is no interest earned

Model Parameter Estimates

To measure the direct effects of Prepaid Card on ATM, Credit Cards on ATM, Debit Cards on ATM and POS Machines on ROA, a multiple least squares regression was fitted to the data. The logarithm of the values was used in the modelling because among other things, the logarithmic transformation is a convenient means of transforming a highly skewed variable into a more normalized dataset. Furthermore, by taking the logs the extremes and the effects of outliers are usually reduced. The results are presented in Table 2.

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Table 2: Regression parameter estimates

Log of variables	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	-2.93871	3.37341	-0.871	0.41255
log(Prepaid Cards on ATM)	-0.01912	0.11694	-0.163	0.87476
log(Credit Cards on ATM)	0.42283	0.08524	4.961	0.00164 **
log(Debit Cards on ATM)	0.95730	0.43864	2.182	0.06540
log(POS Machines)	0.15996	0.16640	0.961	0.36842

Multiple R-squared= 0.8431, Adjusted R-squared= 0.8106, F-statistic= 29.03 on 4 and 7 df, p-value= 0.0001885

The results indicate that Debit card on ATM had a positive significant relationship with ROA at 5% significance level. This implies that a high Debit Cards on ATM implied a high ROA and vice versa. The Credit Cards on ATM and POS Machines were also positively related to ROA but were not statistically significant while Prepaid Cards ATM was negatively related to ROA and non-significant. The regression was also significant at 5% significance level (F-statistic=29.03, p-value=0.00002). This implies that the combination of the independent variables Prepaid Cards ATM, Credit Cards on ATM, Debit Cards on ATM and POS Machines significantly affected the ROA. The R-squared was also satisfactory it revealed that the combination of the independent variables explained 84% of the dependent variable.

Model Diagnostics

The next step in regression analysis was the regression diagnostics which was used to evaluate the model assumptions and investigate whether or not there are observations with a large, undue influence on the analysis. The Figure 2 shows the results for the regression diagnostics.

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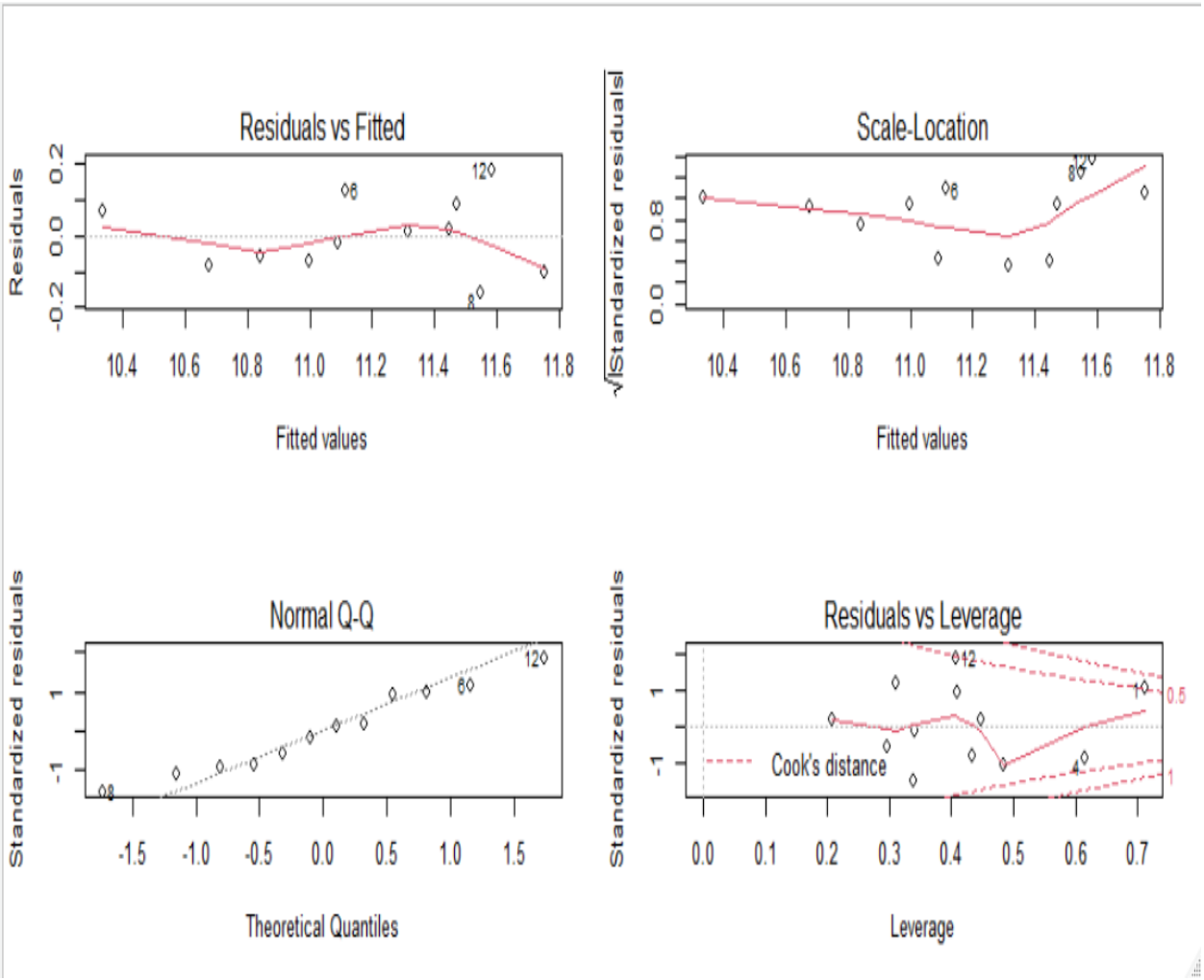

Figure 2: Regression diagnostics

To check the assumption of linearity and homoscedasticity, we used the plot of residuals vs predicted values. If the model does not meet the linear model assumption, we would expect to see residuals that are very large. To assess the assumption of linearity we want to ensure that the residuals are not too far away from 0, that is, the **standardized** values less than -2 or greater than 2 are deemed problematic. Furthermore, to assess the homoscedasticity assumption, we look to make sure that there is no pattern in the residuals and that they are equally spread around the y = 0 line. This assumption was also met. The Q-Q plots were used to test the normality assumption. In this case the observations lie well along the 45-degree line in the QQ-plot, and so we may assume that normality holds here. The **scale-location plot** (square rooted standardized residual vs. predicted value) is useful for checking the assumption of homoscedasticity. In this case the standardized residuals are not trending upward, it is even and the residuals are almost uniformly scattered. This is a sign that the constant variance assumption has been met. Finally, the **Cook's distance** plot was used to measure the influence of each observation on the regression coefficients. The Cook's distance statistic is a measure, for each observation in turn, of the extent of change in model estimates when that particular observation is omitted. Any observation for which the Cook's distance is close to 1 or more, or that is substantially larger than other Cook's distances (highly influential data points), requires investigation. In this case, there are no such observations.

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5.0 Conclusion

Based on the findings of the study, it can be concluded that payment cards had influence financial performance of commercial banks in Kenya positively. The adoption of payment cards by commercial banks has a high potential of improving financial performance and hence better returns to the shareholders. The versatility of payment cards has made their adoption rate to be high among both the banks and their customers. It could have been challenging if the adoption was only with either the banks or the customers. Banks in Kenya have continued to perform well even when other sectors of the economy show lagged performance. This can be explained by the use of payment cards which have enabled banks to start making income away from traditional sources like interest, trade and asset financing. Banks have been able to make more commission income from transactions done on ATMs and POS machines using payment cards.

This study established that value of Debit cards on ATM had great influence on financial performance of commercial banks in Kenya. Value of credit cards and all cards on POS machines also had influence on financial performance of commercial banks however minimal. The results showed a negative relationship between value of prepaid cards on ATM and financial performance of commercial banks in Kenya indicating that the use of prepaid cards on ATMs are likely not to affect the financial performance of commercial banks in Kenya. ATMs reduce the transitionary costs, time cost as well as the transportation cost incurred when travelling to the banking halls. This explains why people use ATMs mostly to withdraw money and are not excited in traditional banking.

Value of debit cards on ATMs had a positive relationship with financial performance. This means that Increase in value of debit cards increases financial performance of commercial banks. Increase in number of ATMs significantly increases the frequency of money withdraw and hence financial performance. ATM transactions affect optimal cash holding in the sense that it reduces waiting and time costs. Therefore, people with ATM cards will be willing to spend money since it is readily accessible. This will lead to increase in debit cards transactions on ATM hence financial performance.

6.0 Recommendations

Banks should continue investing in innovation delivery channels because they are able to control their costs much better as compared to investment on physical branches. The value of transactions that can be processed on channels like the ATMs and POS machines using payment cards are high as compared to delivering such transactions using manual processes. This helps to minimize the cost per unit of service and hence better returns to the banks. Commercial banks should explore more ways of maximizing their utilization and returns from also mobile banking and internet banking.

Since technological innovation is dynamic and aggressively adopted in Kenya, the government should provide incentives for research and development to enable researchers to invest their time and skills in discovering more bank innovations. It is recommended that the government also pursues a strategy to provide economic incentives for technology transfer from more developed economies in order to promote the adoption of world class innovation.

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