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The Strategic JOURNAL of Business & Change MANAGEMENT
ISSN: 2312-9492 www.strategicjournals.com
Vol. 11, Iss.4, pp 738 – 758, October 24, 2024. www.strategicjournals.com, © Strategic Journals

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Accepted: October 11, 2024

DOI: http://dx.doi.org/10.61426/sjbcm.v11i4.3116

ABSTRACT

The research investigated the influence of mobile financial transactions on performance of the Kenyan commercial bank institutions. The study's specific objectives are as follows: to determine the impact of mobile banking transactions, volume and products on the financial performance of Tier 1 commercial banks in Kenya. The study used a descriptive research strategy. The study utilized secondary data in answering the research objectives proposed. The study adopted a census of all tier one banks. Data analysis was done by using descriptive statistics which included percentages, means and standard deviation. Data analysis also includes regression analysis and diagnostic testing. The results of the study confirm that the financial performance of tier-one commercial banks is significantly affected by the adoption of mobile banking services. Precisely, mobile banking products were found to be significant at β =0.350, p- value = 0.010 in influencing bank financial performance. The cost of mobile banking transactions was also found to be positively significant β = 0.507, p value = 0.000 for financial performance. There was a positive and significant effect of mobile banking transaction volume β=0.233, p- value=0.054 to financial performance of tier one commercial banks in Kenya. The results have also indicated that mobile banking is an emerging trend in which case commercial banks are utilizing it as a competitive strategy. The study offered recommendations that can be adopted by tier one banks in R&D, customer education and awareness creation and identifying emerging customer needs for more adoption of mobile banking for enhanced financial performance. In addition, the study made suggestions that can be utilized by future studies.

Key words: *Mobile Banking, Transaction costs, Transaction Volume, Mobile Banking Products*

CITATION: Mwaura, S. N., & Makori, D. (2024). Mobile banking and financial performance of tier one commercial banks in Kenya. *The Strategic Journal of Business & Change Management,* 11 (4), 738 – 758. . http://dx.doi.Org/10.61426/Sjbcm.v11i4.3116

INTRODUCTION

Mobile banking is applied on many countries as a way of improving convenience and accessibility of banking products to existing and potential clients. In the recent past, mobile banking has become the greatest revolution in the banking industry which has seen massive acceptance of different banking products and services being offered on mobile platforms (Bhimjee, Ramos & Dias, 2016). The top nations globally that have embraced mobile banking successfully are South Korea, Hong Kong, Singapore, Spain, United States of America, Australia, France, United Kingdom, Canada, and Germany respectively (Murerwa, 2015). Further, developed markets are experiencing vast changing dynamics in the financial industry, through banking applications that enables customers to make and receive payments from any place in the world by accessing their bank accounts using mobile services (Kemboi, 2018). Additionally, it is evident that countries globally especially commercial banks are taking initiatives in embracing mobile banking as this is an idea whose time has come and cannot be underestimated. Specifically, banks need to take an active role towards turning around their performance strategies by embracing technology (Gupta, 2017).

According to Abong'o (2016), commercial banks in Kenya are likely to be driven out of the market if they fail to use mobile banking. This was after carrying out research about their performance financially focusing on 10 Kenyan banks. In addition to that, banks like the CBA made use of M- shwari mobile financial transaction platform which enable individuals to take loans conveniently from any place without necessarily visiting the bank (Abong'o, 2016). Research conducted by Muiruri, Richu and Karanja (2015) supports the assertions made by Abong'o by indicating that the customers were satisfied with mobile banking because it was reliable despite their worries about security. Gichuki and Jagongo (2018) also supported these assertions by stating that mobile banking is more reliable and accessible, therefore, it has created a vibrant competitive financial industry both in Kenya and the whole world at large

Additionally, studies reveal that there is drastic progress in terms of mobile banking adoption in many nations even for the developing countries (Akwesi, Migiro & Mutambara, 2018; Agwu & Adele, 2014). According to Akwesi *et al*. (2018), research on mobile banking is on the increase following its recent growth and advancements. Further, the authors maintain that studies in mobile banking have neglected fundamental issues among them m-banking accessibility and so forth (Akwesi *et al.,* 2018). Moreover, Agwu and Adele (2014) also observed that there are numerous positive impacts on businesses and individuals throughout the world due to the internet and mobile innovations. Among the industries benefiting greatly according to the authors is the banking industry, which has been transformed globally (Agwu & Adele, 2014). These assertions are supported by Goyal, Pandey and Batra (2015) who opined that the same threats and challenges are experienced in India as well as other Asian regions. Nonetheless, Shaikh and Heikki (2015) opine differently that in overall, there is a profound impact experienced by the business environment due to mobile banking and this cannot be underestimated.

Mwange (2013) points out that mobile banking should not be confused with electronic banking where internet is used through different platforms despite the numerous similarities, but rather be considered as a special product and innovation in the banking industry, distinct in its ways of adoption and application. Although Otieno (2018) notes that mobile banking has been embraced by most commercial banks as a strategic way of ensuring that turnaround strategies are achieved towards enhanced profitability and competitiveness, he also notes that there is scarce research pointing out the socio-economic benefits

of this technological advancements particularly in the developing world.

Statement of the Problem

Focusing on contextual evidence, use of mobile gadgets in the modern banking presents an essential advancement in the present commercial setting. Though its advantages are many compared to various commercial banks, the level to which it is applied raises concerns (Onsarigo & Murugesan, 2014). Although technological developments are anticipated to enhance performance of banks due to improved efficiency, the recent trends are suggesting contrary to this view (Oganda, Mogwambo & Otieno, 2019). For example, according to Kenya Bankers Association (2019), Cooperative Bank's loan book value decreased by 5.7% in 2017, 4.2% in 2018, and 6.4% in 2019; a similar trend observed for Barclays Bank in the same period reporting a 4.9% reduction. Such a trend contradicts the assertion that increased technology adoption should improve efficiency, and enhance better financial performance. Additionally, banks such as Chase Bank and Imperial Bank have in the recent past reported reduced earnings and losses of 18%, 26% and 24% in the years 2018, 2019, and 2020 respectively contrary to the past when they were making profits, leading to a number of banks being closed down because of unsustainable operations such as Chase Bank and Imperial Bank (Mohamed, 2019).

According to Akwesi *et al.* (2018), there is a close association amid mobile banking and fiscal performance for the case of financial institutions. Moreover, Agwu and Adele (2014) also stated that banks which adopt mobile banking in the modern business environment are likely to benefit from improved financial performance, thus, supporting the claim by Akwesi *et al*. (2018). Moreover, reviewed, literature has revealed a contextual gap especially in failing to identify the link between mobile banking and financial support (Ndirangu, 2014; Kathuo, 2016; Abong'o, 2016). In this regard, different assertions are made for and against mobile banking impact on financial performance. For example, a group of authors back up the information that Mobile banking saves time which boosts the fiscal performance of commercial banks (Mabwai, 2016; Kirui, 2016; Kiprop *et al.,* 2016), others indicate that there is no relationship that exist (Tam & Tiago, 2015; Chepkemoi, 2015). Therefore, this compels the manner in which this research was carried out, to provide answers as reinforced by Akwesi *et al*. (2018) who state that ancient intellectuals have disregarded relevant issues which will be discussed in detail in the present research by concentrating on the volume's transaction, costs of transaction, and products of banking due to Mobile banking.

Objectives of the Study

The general objective of the study was to determine the effect of mobile banking on financial performance of tier one commercial banks in Kenya. Indicated below are the definite aims that guided this research:

- To establish the effect of mobile banking transaction volume on financial performance of tier one commercial banks in Kenya.
- To determine the effect of mobile banking transaction costs on financial performance of tier one commercial banks in Kenya.
- To determine the effect of mobile banking products on financial performance of tier one commercial banks in Kenya.

LITERATURE REVIEW

Schumpeterian Theory of Innovation

The model was first coined by Schumpeter in 1934 and is considered most tangible model explaining innovation in the business environment (Schumpeter, 2016). Schumpeter focused on consumers' desire to satisfy their needs, and established that invention was the basis towards competitive advantage and profitability. According to the theory, it is explained that the central innovator in the model of innovation is the

entrepreneur motivated by economic changes in the society (Swedberg, 2013). Further, Schumpeterian theory of innovation holds that society thrives in the ability of upholding antagonistic tendencies and contradictions (Peilei, 2011). The existence of these contradictions provides an impetus opportunity in the process of innovation so as to establish solutions to such gaps and divide in society. As a matter of fact, Schumpeter further indicates that the result of this aspects of innovation development are founded on the quantitative and qualitative efforts of combining existing resources towards innovation development (Westland, 2016). Despite the fact that establishment of new set of resources was still possible. Schumpeter's argument indicates an inverse association between innovation and resistance to change, making it possible to utilize existing ones in propagating growth and improved performance in different industries (Ziemnowicz, 2020).

Market Power Theory

According to the theory, banking institutions are provided with ability to expand their product and share of markets, due to the specific superiority they develop on their services and products as proposed in 1983 by Muller (Ahlstrom, 2010). Particularly, the theory focused on the need for banks to increase their returns by demanding higher prices and offering a range of services which are regarded to be convenient by the consumers (Davis, 2008). Essentially, the theory looks at power from two perspectives, empowering the entities in the market as well as empowering consumers, whilst ensuring that they attract them and enhances loyalty for their products (Diaz, 2012). According to the theory, efficiency into the market is enhanced by innovations which enable banking institutions to align their activities which are aimed at accentuating different operations of financial institutions (Roth, 2012). Moreover, the theory argues that change in financial sector is enhanced by different developments and changes in the financial regulatory framework, which makes it possible for organizations to focus on reengineering their strategies and innovations towards a sustainable competitive advantage.

It is on the basis of market power that organizations can potentially attain higher competitive advantages in the market. Thus, any organization that seeks to increase its performance levels and command high proportion of the market share, must appreciate the relevance of financial innovations, particularly those in the banking business. Internet banking and mobile banking are the most recent developments that have provided convenience not only to the customers but also to the banks in general.

Task Technology Fit (TTF) Theory

The third concept to be reviewed in this study is Task Technology Fit Theory projected by Goodhue and Thompson in 1995, which holds that there are higher chances of having good performance in an individual financial institution if the information communication technology capabilities in place do match with the specific tasks that must be performed (Cane, McCarthy & Halawi, 2010). In other words, the theory supports the assertion that technological aspects and developments must be conceptualized, by understanding the needed tasks to be performed by the users. The users in this case can be the stakeholders in the banking institutions such as the management, the employees, and even the customers in enhancing an effective interaction and communication (Kankanhalli, Tan & Wei, 2015). The facets of this theory are to have a technological discovery that is suitable to industry specific demands and needs. For example, in the case of banks, the primary goal is to facilitate financial transactions from customers to the bank, in promoting efficiency and convenience to both the customers and the business in differentoperations.

The theory puts emphasis on identification of factors which determine the suitability and fitness of a technology (Cane *et al.,* 2011). Fundamentally,

the theory supposes that for an innovation to be relevant, it has to meet certain characteristics, that in overall makes the users to be more satisfied when compared to former approaches and technologies. In this regard, this model is significant to the present research because it supports the point that mobile banking has improved efficiency for the banks, as well as for the customers owing to its numerousmerits and features.

Technology Acceptance Theory

Finally, the theoretical review will include the technology acceptance model that was proposed by Ajzen and Fishbein's in 1989, which supports the fact that once an innovation has been made in the society, it has to be accepted by different stakeholders owing to perceived relevance of such an innovation (Okafor, Nico & Azman, 2016). According to the model, the most imperative factors for an innovation to be accepted are how easy it will be to be used and the overall perceptions about its usefulness (Rahimi, Nadri, Hadi & Timpka, 2018). On perceived usefulness, a development is usually analysed from how it will improve service delivery, how it will improve convenience, how it will reduce operational costs, and so forth. By contextualizing this argument in the banking industry, it is established that mobile banking must be evaluated by commercial banks on how important it will be to the bank as well as to the customers (Nadri, Rahimi, Lotf, Samadbeik & Garavand, 2018).

The theory explains that the potential change in behavior among the users is important, and this entails customers and employees in banks (Nadri *et al.,* 2018). For instance, if it is established that customers will generally consider such developments as friendly, secure, easier to use, less costly, and convenient, then their behaviors will shift towards its adoption. Further, employees must also be factored in, because most of the tasks that will be performed by such applications are often those done by employees in banking institutions, hence raising fears on employment and job security (Muhammad *et al.,* 2015). Moreover, such technologies can also be seen as ways of making employees' work easier and manageable. Depending on the net effect, this has to be considered as it will support its usage or lead to change resistance. However, the central focus should be on the customers who are directly impacted by such developments, and who the main target population is as they generate revenues for banks (Fathema *et al.,* 2015). In view of this theory, it is imperative for the managers and the owners of the banks to come up with a clear model in which employees are informed, and such planning must include them so that they minimize potential incidences of change. This is an appropriate change management mechanism that is impetus in making the overall adoption and implementation of mobile banking projects successful, with the aim of increasing needed financial returns both in the short term and in the long term.

Efficient Market Hypothesis

This is a fiscal and cost-effective model which maintains that the overall financial performance and the market cost of assets always indicates the available information (Schwert, 2003). Any upcoming evidence can cause a shift in the normal market costs which causes a difficulty in overcoming the trends in the market in a consistent manner (Mandelbrot, 1963). Since EMH is founded on the risk adjustment terms, it can make it testable on the basis of predictions especially when the model of risk is coupled with specific and identifiable hazards (Fama, 2013). More emphasis has been put on the anomalies in the market by various scholars since the year 1990 and this suggests that any anomaly from the risk that has been identified has been examined. It is very difficult to foretell the concept of market fiscal returns precisely, but it can be strictly related with the theoretic dimensions of this model to provide data for both economic and financial researches (Samuelson, 2015). Therefore, this model gives a basis for reasonable investigation of hazard- based concepts in the current markets owed to trends and

variations which introduce new behaviors to the market players. Moreover, this indicates that the concepts of asset costs in the modern contexts are instituted on peril models which basically come up from EMH (Fama, 2013).

The EMH model is closely supporting the current research since the main emphasis is on how commercial banks are able to change their operational tactics as a result of other players in the market. Essentially, this implies that once technological strides are made in the market by a few players, the rest of the players in the market become aware and as a result they embrace such technological innovations, with an aim of improving performance. In other words, if a bank is able to attain innovations such as use of mobile devices in banking and make it difficult for other players to access the information (which is difficult), then it can achieve a competitive advantage in the market.

Empirical Review

Mobile Banking Transactions Volume and Financial Performance

According to Wadada (2019) on Mobile finance with regard to a number of features, one of the observations made is that mobile banking increased the transaction volume by customers especially to commercial banks. Further, the author noted that as transaction volume increased, and so is the revenue amount for a bank, as the two have a positive and strong correlation. More importantly, transaction volumes were found to be increasing because mobile banking increased the number of customers accessing banks through mobile lines, in facilitating bank transfers, withdrawals and deposits respectively. This enhanced increased revenue through activities such as fund transfers, given that banks charge certain amount of money for every transaction, including those undertaken by m-banking. In other words, Wadada (2019) demonstrates an association of positive effect amid mobile banking transaction volume and fiscal presentation of commercial banks. Although the research has concentrated on mobile banking, it was limited to commercial banks while the current study has narrowed its scope to the tier one commercial banks only, meaning that there is a contextual gap in this study.

Mobile Banking Transaction Costs and Financial Performance

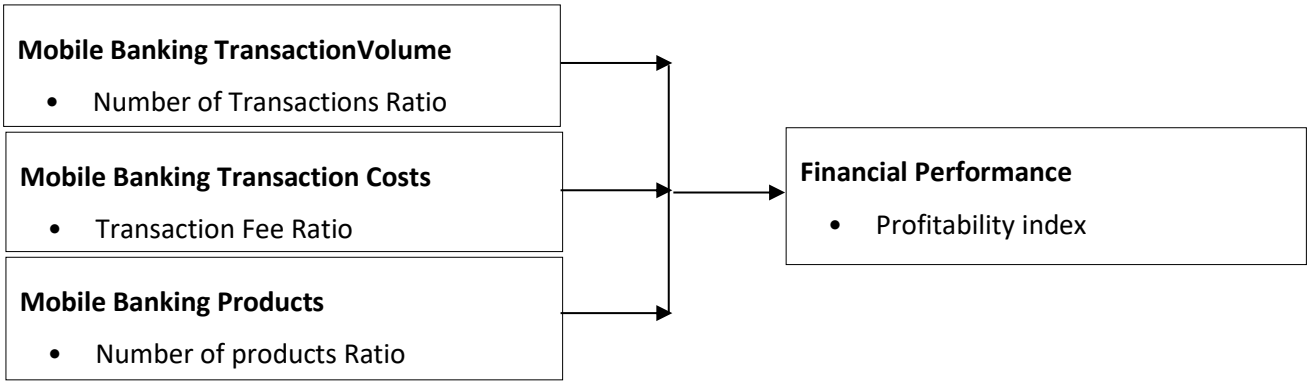
Another variable for the research was on the influence that Mobile banking has on costs of transaction, and how this impact financial performance of higher-level commercial banks. Mohamed and Omar (2018) specifically focused on Mobile transaction costs, but on the effect, it has on Small and Medium Sized Enterprises (SMEs). However, their study established that mobile banking transaction costs were costly for SMEs, hence affecting their financial performance negatively. Deducing from these results, it can be interpreted that mobile banking makes individuals and businesses to spend more in terms of transaction costs as opposed to when they use over the counter services. The implication of this is that banks in return make more money generated from transaction costs as opposed to when they do not use mobile banking. This outcome from Mohamed and Omar (2018) is contrary to the findings noted by Coderias (2017) who was demonstrating that customers are the ones who benefit a lot from mobile banking; in this case customers entails individuals and businesses such as SMEs. While Mohamed and Omar (2018) focused on SMEs, the concentration of the present research will specifically be on the higher-level commercial banks.

Mobile Banking Products and Financial Performance

Chepkemoi (2015) indicated mobile banking is heralded in the financial and banking industry due to numerous products that are offered to the customers. Specifically, these products present ease of doing business among customers of commercial banks, and even the banks in their operations. Some of the features or products

which are noted by Chepkemoi (2015) include *Pesa-pap, M- kesho, M-shwari, bill payment, Eazy-loan*, and *KCB-Mpesa* among others. Chepkemoi (2015) argues that when customers are provided a number of products to select from, their sovereignty is enhanced, and this improves customer loyalty. It is through customer loyalty that the concept of improved financial performance for the banks emanates from, as customers are able to transact freely, hence increasing revenue generated by banks. However, Chepkemoi (2015) warns that this should not be perceived to mean that there are no limitations of these many applications or products as customers are constantly concerned with their safety and security measures. The study by Chepkemoi (2015) was primarily on banks in general but the current study will narrow the focus specifically to tier one commercial banks.

Conceptual Framework



Independent Variables **Dependent Variable**

Figure 1: Conceptual Framework

Source: Research (2024)

METHODOLOGY

This study adopted a quantitative approach, in which descriptive research design was used in analyzing data. Targeted elements of investigation were the tier one Kenyan banks in commercial categorization Concentration is application and using mobile banking and the effect this has on performance. Precisely, banks were focused on performance metrics from the year 2017 to 2021, hence covering a period of 5 years. In this case, the respondents of the study were all the tier one Kenyan banks in commercial category which are 8 in number.

The researcher carried out a census survey following the assertions by Collis and Hussey (2014) and Creswell (2014) who maintain that sampling is only possible in situations where the population is too large and not feasible to be studied on a census survey.

Regression model was formulated from reviewed literature and the conceptual framework to guide the conduct of the study. Creswell (2014) gave the following form of the regression equation as adopted:

$Yit = \beta O + \beta 1X1ti + \beta 2X2ti + \beta 3X3ti + \varepsilon$

Where:

Y = Financial performance (Dependent variable)β_O = Model's coefficient

$\beta_1$to β_3 = Varying coefficients in each variable (independent)X_1 = Mobile Banking Transaction Volume

X_2 = Mobile Banking Transaction Cost X_3 = Mobile Banking Products

ε = error of the modelt = Time factor

i = Firm or bank.

The researcher concentrated in obtaining facts in terms of mobile volumes of transaction, charged costs on mobile transactions, and products of mobile banking. For the financial performance, the investigator requested for audited fiscal reports, which includes report of fiscal situation and yields and forfeiture account. Otherwise, these reports were also acquired from the websites of banks or NSE, and also from the Kenya Bankers Association.

Once desired information was acquired, the scholar extracted the appropriate data that was required, for investigation. This contained categorizing the profitability of the bank for the era under analysis using Excel Spreadsheet. Specifically, data analysis techniques used were descriptive statics which include mean, STD, percentages/ratios, and frequencies. Additionally, inferential statistics were carried out to find out coefficient of correlation in which case results were presented in a regression model discussed in the empirical model section above.

Analytical checks were used to define the importance of investigation methods and in this situation the scholar concentrated on normalcy check, multicollinearity check, stationarity check, heteroscedasticity check, autocorrelation check, and Hausman check respectively.

FINDINGS AND DISCUSSIONS

Descriptive Statistics

A descriptive statistical analysis of the data used in this study was carried out to determine the mean, standard deviation, maximum, and minimum values. The findings are summarized in Table 1.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation	Max	Min	Observations
Financial Performance	73.51	11.57	89.48	59.42	40
Mobile Banking Transaction Volume	46.15	19.85	62.30	28.90	40
Mobile Banking Transaction Costs	32.87	0.09	40.61	19.82	40
Mobile Banking Products	18.92	2.37	26.80	12.50	40

Source: Research Data (2023)

Table 1 shows that, the mean financial performance was 73.51%, suggesting a high level of efficiency across the surveyed banks. This high financial performance aligns with the findings by Smith and Johnson (2018), who noted that better management practices were closely linked to higher performance scores. Transaction Volume had a mean of 46.15%, which is somewhat in the middle of the range. The high standard deviation of 19.85% indicates that this variable fluctuates considerably across the studied banks. This supports the work of Wadada (2019) who stated that transaction volumes were found to be increasing because mobile banking increased the number of customers accessing banks through mobile lines, in facilitating bank transfers, withdrawals and deposits respectively. The study also aligns with Wadhwa (2017) who indicated that commercial banks greatly benefits from digital mobile banking, which enables individuals to access their accounts conveniently and from any place, thus increasing activities in general.

Transaction Costs averaged at 32.87%, and the notably low standard deviation of 0.09% suggests that cost management practices are fairly consistent across the banks. This observation is consistent with research by Mohamed and Omar (2018) who established that mobile banking transaction costs were costly for SMEs, hence affecting their financial performance negatively.

The findings also align with Coderias (2017) who demonstrated that customers are the ones who benefit a lot from mobile banking; in this case customers entails individuals and businesses such as SMEs. In addition, Products had a mean value of 18.92%. This moderate figure indicates that banks are offering a reasonable variety of products to their customers. This is in line with research by Tam and Tiago (2015) explains that adoption of mobile banking and its associated products by banks is a matter of technological developments, and banks must comply to this marketing trend whether it is leading to better performance or not. The study finding also align with Kiprop et al. (2016) who noted the ability of sending money not only between accounts in the same bank but also to other banks has really improved the banking industry, leading to a positive impact on financial performance. Therefore, the data shows that high financial per/formance is associated with controlled transaction costs and a diversified product range, which confirms existing literature on the subject.

Trend Analysis

Trend Analysis of Financial Performance

The study used trend analysis to analyze the movement patterns of financial performance with an aim of identifying directions as indicated in Figure 2.

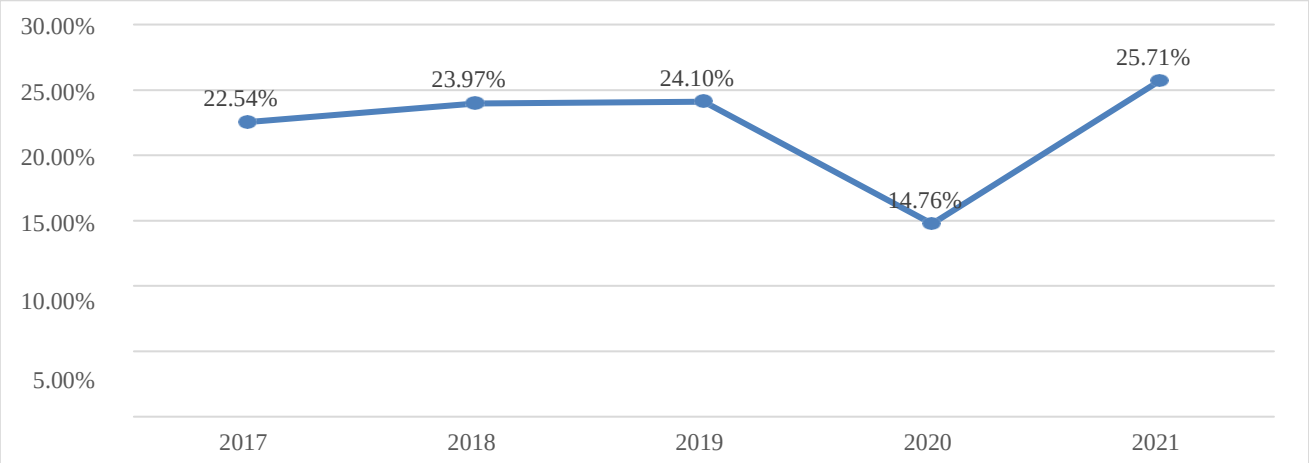


Figure 2: Financial Performance

Source: Research Data (2023)

Figure 2 depicts the financial performance of Kenya's tier one commercial banks from 2017 to 2021. The performance began at 22.54% in 2017 and increased gradually in succeeding years, reaching 24.10% in 2019. This consistent development may show a beneficial correlation between mobile banking adoption and financial wellbeing. However, performance fell precipitously in 2020, falling to 14.76%. A drop of this magnitude could indicate issues in the mobile banking domain or external economic factors. In contrast, 2021 had a strong comeback, with a 25.71% increase, indicating effective modifications or expansions in mobile banking techniques. This oscillation and subsequent recovery are consistent with Omondi's (2020) claim that, while digital banking platforms, including mobile banking, have the potential to strengthen a bank's financial position, they also introduce vulnerabilities, necessitating agile strategic responses to maintain andimprove performance.

Trend Analysis of Mobile Banking Products

Mobile banking is one of the financial innovations that has brought significant value to the banks as well as enhancing customer experience for more than ten years (Alsmadi *et*

al., 2022). The study used trend analysis to establish the developments and patterns within the mobile banking with findings shown in Figure 3.

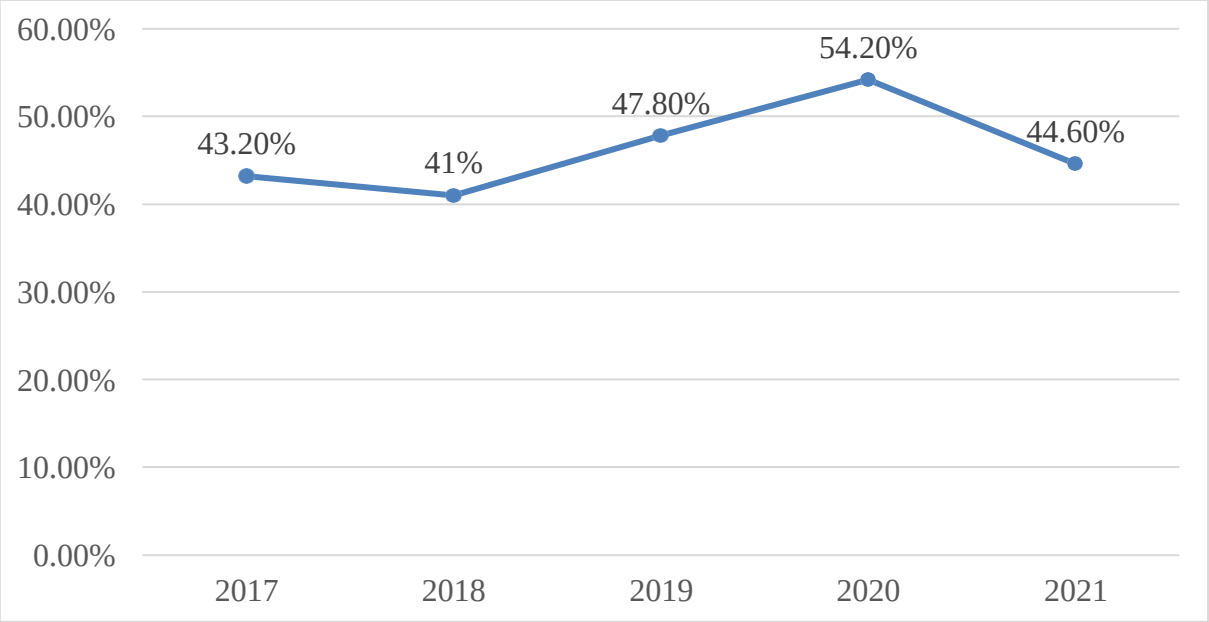


Figure 3: Mobile Banking Products Source: Research Data (2023)

Figure 3 illustrates the trajectory of Mobile Banking Products from 2017 to 2021 for top-tier commercial banks in Kenya which offers valuable insights. Commencing at a rate of 43.20% in 2017, there was a little decrease to 41% in 2018. However, there was a notable increase from 2018 to 2020, reaching a peak of 54.20%. This increase indicates a strong growth or improvement of mobile banking services throughout this time. However, in 2021, there was a decrease, with the final value reaching 44.60%. This could suggest market saturation, shifting consumer tastes, or possible difficulties in distinguishing the product from competitors. The work of Njenga (2019) reflects similar patterns, highlighting that the initial expansion of mobile banking products can result in significant growth for banks. However, sustaining this progress requires ongoing innovation and adaptability to meet changing market needs.

Mobile Banking Transaction Cost

Mobile transaction cost is acritical determinant in the adoption of financial innovation as the costs have direct effect on consumer adoption (Okenyuri, 2019). The study analysed the trend of mobile banking transaction cost to establish the pattern as shown in Figure 4.

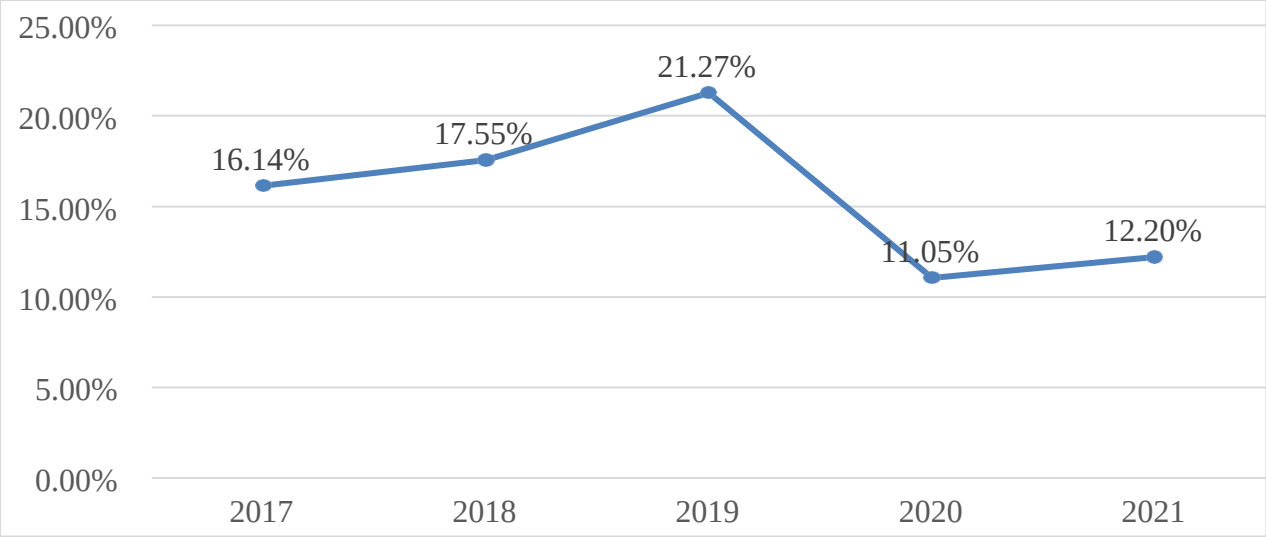


Figure 4: Mobile Banking Transaction Cost Source: Research Data (2023)

Figure 4 depicts the trend in Mobile Banking Transaction Costs for Tier One Commercial Banks in Kenya from 2017 to 2021 indicating an intriguing trajectory. From 16.14% in 2017 to 21.27% in 2019, there has been a substantial increase. This increase could indicate that as banks expanded their mobile banking products, the accompanying transaction costs rose, presumably as a result of infrastructure or operational investments. However, by 2020, the figure had dropped dramatically to 11.05%, showing significant cost savings, maybe due to economies of scale, optimized procedures, or technology breakthroughs. The year 2021 saw a slight increase to 12.20%, indicating stabilization. In line with this pattern, Mwangi (2018) proposed that, while the initial phases of mobile banking adoption may result in higher transaction costs due to necessary expenditures, these costs tend to normalize or even drop over time as the system matures and efficiencies are realized.

Mobile Banking Transaction Volume

Mobile banking transaction volume is a measurement used in analyzing transactions that are carried out through mobile phone in a given time period (Gathu & Njenga, 2021). The study analysed mobile transaction volume where the findings were displayed in Figure 5.

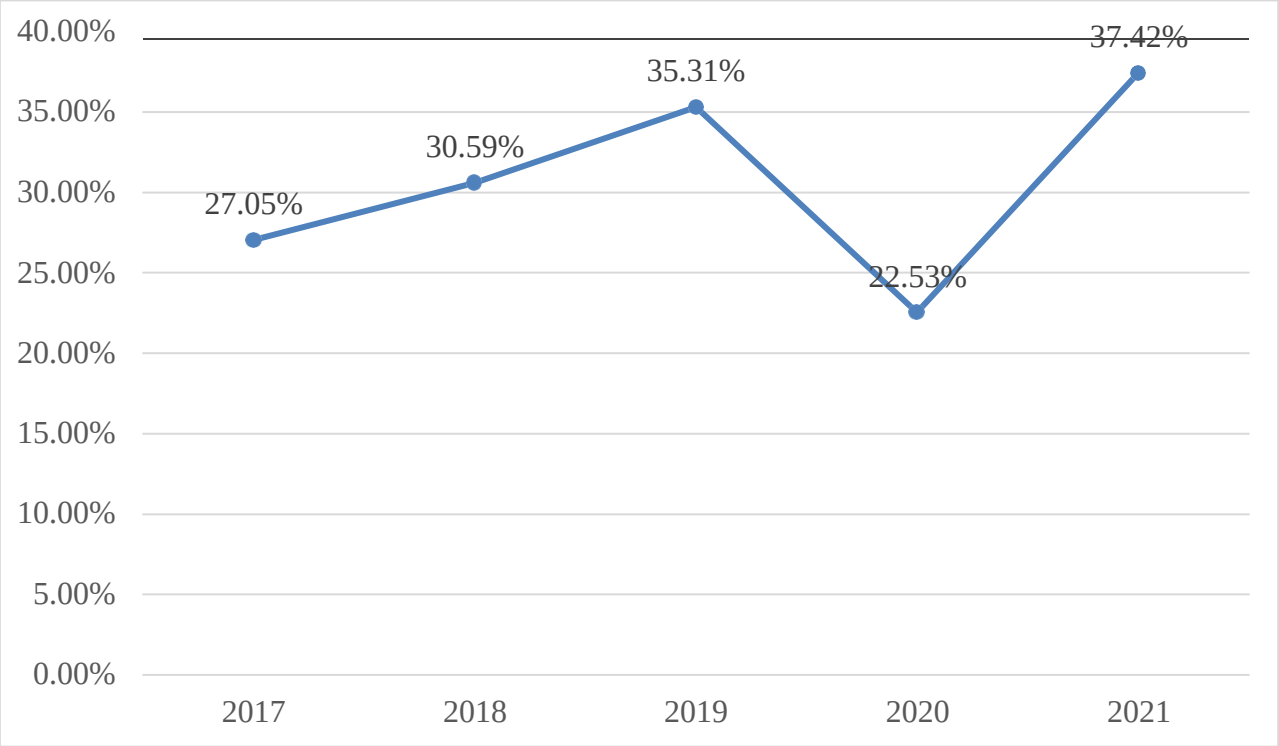


Figure 5: Mobile Banking Transaction Volume

Source: Research Data (2023)

Figure 5 shows Mobile Banking Transaction Volume for Tier One Commercial Banks in Kenya from 2017 to 2021 reveals an intriguing trend. The volume began at 27.05% in 2017 and gradually increased to 30.59% in 2018. However, in 2019, the figure fell to 22.53%, indicating a brief slowdown in mobile banking activity or a shift in customer preferences. However, this contraction was short-lived, with 2020 showing a return to 35.31% and the momentum continuing into 2021, with 37.42%. This recent recovery could be attributed to increased trust in mobile banking or the advent of more user-friendly interfaces and various financial offerings. In line with these observations, Ochieng (2019) stated that when mobile banking platforms grow and incorporate more innovative features, there is a corresponding increase in transaction volumes, attributable mostly to improved user experience and trust in digital transactions.

Correlation Analysis

In order to demonstrate the influence of mobile banking metrics on tier one commercial banks' financial performance in Kenya, Karl Pearson Product Moment correlation coefficient was used. The technique was used based on its wide application in the analysis of relationship between variables where coefficient values range between -1 and +1 indicating perfect negative correlation, perfect positive relationship and zero denotes no correlation. Interpretation of correlation coefficient has been suggested by Senthilnathan (2019) that coefficient values between 3.5-5.0 denote moderate correlation, 0.5 to 0.7, strong correlation while 0.7 to 0.9, very strong correlation. This approach aligns with the general objective and the specific objectives of the study. The findings are presented in Table 2.

Table 2: Correlations

		Mobile banking transaction volume	Mobile banking transaction cost	Mobile banking products	Financial performance
Mobile banking transaction volume	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	40			
Mobile banking transaction cost	Pearson Correlation	.731**	1		
	Sig. (2-tailed)	0.000			
	N	40	40		
Mobile banking products	Pearson Correlation	.811**	.789**	1	
	Sig. (2-tailed)	0.000	0.000		
	N	40	40	40	
Financial performance	Pearson Correlation	.818**	.873**	.865**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	40	40	40	40

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

Based on Table 2, there is a positive correlation between transaction volume and financial performance of Kenyan tier one commercial banks (r = 0.818, p-value = 0.05). These findings align with the first specific objective of the study, which sought to establish the effect of mobile banking transaction volume on financial performance. In addition, Transaction Costs exhibited a positive and significant relationship with the financial performance of these banks (r = 0.873, p value < 0.05). This supports the second specific objective, aiming to determine the effect of mobile banking transaction costs on financial performance. Further, products also had a positive and significant influence on financial performance (r = 0.865, p value < 0.05). This directly pertains to the third specific objective of the study, which aimed to understand the effect of mobile banking products on financial performance.

Previous study findings by Mikae and Mogwambo (2022) on mobile banking influence on financial performance within the Sacco sector in Kenya reported that mobile banking had a positive and significant relationship with financial performance of K-Unity Sacco. The current study findings align with Mikae and Mogwambo (2022) as mobile banking transactional volume, mobile banking transactional cost and mobile banking products have positive relationship with financial performance hence confirming previous study. another study by Maina and Mungai (2019) targeted mobile banking withdrawal, mobile banking loan product, mobile banking payment and mobile banking transfer where the findings indicated that all the four variables had positive and significant relationship with financial performance of tier one commercial banks in Kenya. However, only loan product of mobile banking and mobile banking payment had strong relationship at r= 0.772, p value<0.05 and r=0.822, p value<0.05 respectively. Mugane and Njuguna (2019) also considered how mobile banking affected financial

performance where short message service, person to person payment, airtime top up and bill payment services were used to predict their relationship with financial performance of commercial banks in Kenya with findings that bill payment and airtime top up had very strong relationship, short message had strong relationship while person to person recorded a moderate relationship. This means that all the four variables had positive and significant relationship with financial performance of commercial banks in Kenya. The current study has found that all the four variables of mobile banking; transactional volume, transactional cost and mobile banking product have very strong relationship with financial performance. The study has confirmed the findings of previous studies but has also shown enhanced relationship where different variables of mobile banking are used to predict relationship with financial performance.

Regression Analysis

Model Summary

The study used regression analysis to produce model summary to showed the quality of the models and the proportional variation of the dependent variable due to the predictor variables. R, R Square, Adjusted R Square and Standard Error of the Estimates were used in the analysis with findings indicated in Table 3.

Table 3: Model Summary

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.927[a]	0.860	0.849	0.31276

a. Predictors: (Constant), Mobile banking products, Mobile banking transaction cost, Mobile banking transaction volume

Source: Research Data (2023)

From Table 3 findings, R is the correlation coefficient which indicates the quality of the prediction of the outcome variable indicated by 0.927 which signified a high quality. The R Square, 0.860 showed the proportion of variation of the outcome variable may be explained by the predictor variables. The R Square also indicates how well the model is fitting the data set but does not give all the information as it excludes residual plots and other statistics (Dhakal, 2018). From the findings, 86% of the predictor variables; mobile banking transactional volume, mobile banking transactional cost and mobile banking products explained the variation of financial performance of tier one commercial banks in Kenya. The other 14% factors were however, outside the scope of the study.

Table 3 also showed the Adjusted R Square = 0.849 which helps correct the number of predictors variables in the model hence penalizing the high number of independent variables when the R Square is used (Vasquez, 2020). Additionally, Dhakal (2018) noted that the advantage of using Adjusted R Square is that it gives a true reflection of variation in the outcome variable as it adjusts for the increase of the predictors and controls for any overestimation that may exist in the model hence 84.9% of variation of the dependent variable explained by the predictor variables. The Standard Error of the Estimate was also used to measure the precision of the model which signifies how wrong the study could be in using the model to predict the outcome. The Standard Error decreases when the R Square increases hence should be as small as possible. From Table 3, the Standard Error of Estimates was 0.31276 which was considered small hence minimal chance that the model could be wrong in the prediction. Previous study by Mwita *et al*., (2023) reported an R Square of 0.824 and Adjusted R Square of 0.805 when mobile banking transaction volume, mobile banking transaction value and mobile

banking loans were used in the model. The current study used mobile banking transaction volume, mobile transaction cost and mobile banking products and recorded an improvement in the R Square of 0.860 and an Adjusted R Square of 0.849 hence an improvement in the model's quality and enhanced variation in the dependent variable different from the previous research.

Analysis of Variance

The study used analysis of variance to understand the patterns between and within the groups as presented in Table 4.

Table 4: Analysis of Variance Test

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	21.670	3	7.223	73.845	.000[b]
	Residual	3.521	36	0.098		
	Total	**25.191**	**39**			

a. Dependent Variable: Financial performance

b. Predictors:(Constant),Mobile banking products, transaction cost, Mobile transaction volume

Source: Research Data (2023)

From Table 4, the Sum of Squares column indicated the sum of score variances with and between groups and the sum of all total for the whole sample. The mean square column signified the variation existing between and within groups while the p-value showed significance of variation in the groups (Dhaka, 2018). From the results in Table 4, F (39) =73.845, p- value=0.000 showed that there exists significant variation within and between groups of tier one commercial banks financial performance.

Regression Coefficient

Statistical analysis using t statistics was used to examine the contribution of individual variables in this study, as shown in Table 5.

Table 5: Regression Coefficient

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.265	0.275		0.962	0.0343
	Mobile banking transaction volume	0.233	0.117	0.219	1.989	0.054
	Mobile bankingtransaction cost	0.507	0.118	0.452	4.311	0.000
	Mobile bankingproducts	0.350	0.129	0.331	2.706	0.010

a. Dependent Variable: Financial performance

Source: Research Data (2023)

Based on Table 5, the constant, also known as the y-intercept, is 0.265. This means that when all other variables are zero, the expected value of the dependent variable (financial performance among tier one commercial banks in Kenya) is 0.265 with a probability (P-value) of 0.0343, which is less than the typical significance level of 0.05, the constant is statistically significant. For every unit increase in Mobile Banking Transactional Volume, the financial performance among tier one commercial banks in Kenya increases by 0.233units, holding other variables constant with a P-value of 0.054, which is less than 0.05 hence significantly affecting financial performance.

For every unit increase in Mobile Banking Transactional Costs, the financial performance among tier one commercial banks in Kenya increases by 0.507 units, holding other factors constant with a P-value1of 0.000, which showed that Mobile Banking Transactional Costs had positive and significant effect on financial performance of tier one commercial banks in Kenya. For every unit increase in Mobile Banking Products, the financial performance among commercial banks in Kenya increases by 0.350 units, holding everything else constant with a P-value of 0.010, which is less than 0.05, indicating positive significant effect on financial performance of tier one commercial banks in Kenya.

CONCLUSION AND RECOMMENDATIONS

According to the study, the results suggest that mobile banking transaction volumes do not significantly affect the financial performance of tier one commercial banks in Kenya. Essentially, the main assumption in this case is that since customers are able to carry out transactions at the comfort of their mobile platforms, they often tend to have numerous transactions oblivious of the transaction charges, which eventually form part of the revenue pool for the banks.

The findings of the study led to the rejection of the null hypothesis that mobile banking transactional costs have a significant effect on financial performance of tier one commercial banks in Kenya. From the findings, it is evident that the costs incurred by customers while completing transactions through mobile banking are indirectly revenues for the banks. Such costs result from transferring funds, checking bank balances, obtaining bank statements, paying bills and ordering cheques among other services. Thus, charging some costs on mobile banking is vital for banks to generate revenues to improve their financial performance.

The study findings led to the rejection of the null hypothesis that mobile banking products have a significant effect on financial performance of tier one commercial banks in Kenya. Thus, it is clearly evident that banking products resulting from mobile banking have a positive and significant correlation with financial performance. The study concluded that mobile banking products are easy to use, enhance convenience and are relevant to consumer needs hence their high adoption that results to more financial performance.

The study conclusion was that mobile banking transactional volume significantly affects financial performance of tier one commercial banks in Kenya. The study recommends the need for improvement in overall accessibility of mobile banking services, a fact that should act as a motivation to customers to transact remotely in all their transactions, thus, increasing the volume of transaction which translates to more revenues. Additionally, this should be streamlined to meet the emerging trends among mobile service providers who have provided stiff competition in the recent past. Moreover, with emerging trends such as COVID-19, banks should use this as an advantage to encourage their customers to transact through mobile platforms. The banks should also enhance customer education on the use of mobile banking and undertake consumer research to understand gaps experienced during mobile banking navigation. This will help the banks identify areas of improvement as well as equip customers with skills needed to maneuver the mobile banking

transaction thus increase their interaction and volume of transaction for more financial performance. The banks should also ensure safety of customers while navigating in the mobile transaction by incorporating a robust cyber security check for assurance of safety in the mobile banking transaction. This is to enhance consumer confidence and build or increase trust thus more interaction leading to increased mobile transaction volume thereby enhance financial performance.

The second objective was concluded that mobile transaction costs have significant effect on tier one commercial banks' financial performance. The study made a recommendation that banks need to ensure that their transaction costs are not more than that of the competitors since customers are sensitive to such costs as they are an expense to them. As such, banks should strive to focus on efficiency whilst charging costs in the level of their peers, as this will be the basis of attracting and retaining their customers. It was recommended that banks should enhance their value proposition to the customers by building a strong customer service and developing a seamless mobile banking platform. This will result to customer loyalty hence may not consider the premium pricing that may be charged by the banks. With more customer loyalty, the banks will be able to reap more benefit from their customers leading to enhancement of financial performance. The banks should also create awareness to their customers on the importance of mobile banking. This will enhance migration of customers to mobile banking thus increased revenue to the banks.

Based on the results of the last objective, we concluded that1mobile banking products have a significant impact on Kenya's tier one commercial banks. The study recommended that commercial banks should invest heavily on research and development (R&D) in establishing various banking products that should be digitized in addition to coming up with new services or products that should attract customers and retain them so as to enhance competition and increase financial performance. Fundamentally, the fact that the world of business is significantly adopting digital solutions,+ banks should leverage their operations on the new innovations and technologies to improve on performance. The study also recommended that banks should develop products that meet the needs of the customers for enhanced acceptance. There should also be product diversity to meet different customer needs.

There are a number of suggestions made especially to future scholarly works in bridging existing gaps and contributing to overall existing body of knowledge in this field. Firstly, the study recommends that future researchers should adopt primary data methodology in order to refute or uphold findings of the current research which are mainly founded on secondary data. Secondly, future researchers are encouraged to widen their scope as the current research was limited on the tier one commercial banks, to include other banks so that the findings can be replicated across the financial or banking sector. Lastly, the researcher recommends future studies to explore on any possible innovations in mobile banking that are not within the scope of the current research in order to enrich practice and policies in the sector.

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