

Effect of Internet Banking on Financial Performance of Commercial Banks Listed on the Nairobi Securities Exchange

Tom Oboke Ndhine¹, Patrick Kibati², Daisy Bowen²

¹(School of Business and Economics, Kabarak University, Kenya)

²(School of Business and Economics, Kabarak University, Kenya)

³(School of Business and Economics, Kabarak University, Kenya)

Abstract: The financial challenges faced by commercial banks in Kenya albeit the increased adoption of electronic banking as well as scanty pertinent empirical evidence, have necessitated this study which sought to establish the influence of e-banking on financial performance of commercial banks in Kenya. Specifically, the study examined the effect internet banking on financial performance of listed commercial banks in Kenya. The study was guided by the innovation diffusion, and economic value added theories. An explanatory research design was adopted. The 11 commercial banks listed at the Nairobi Securities Exchange as at December 31st, 2020 constituted the accessible population. Purposive sampling technique was employed to obtain a sample of 11 listed banks from the 42 licensed banks in Kenya. The study used secondary data which were panel in nature covering a period from 2014 to 2020. The pertinent data were collected using a structured data collection sheet through desk research. The Statistical Package for Social Sciences was used to analyze data using both descriptive and inferential statistics. The results of the analyses were presented in form of tables. According to the study findings internet banking ($p = 0.016$) had statistically significant correlation with return on equity (the indicator of financial performance used in this study) at p -value = 0.05. The results of simple linear regression analysis indicated that, at p -value = 0.05, the effect of internet banking on financial performance was statistically significant ($t = -3.561$; $p = 0.016$). It was concluded that internet banking was an important dimension of electronic banking with regard to financial performance of listed commercial banks. It is recommended that commercial banks should be more comprehensive in their reporting on internet banking.

Key Word: Commercial banks; financial performance; internet banking; Nairobi Securities Exchange.

Date of Submission: 12-08-2022

Date of Acceptance: 27-08-2022

I. Introduction

Background of the Study

Electronic banking abbreviated as e-banking is also known as electronic funds transfer (EFT). It describes the use of electronic means to transfer money or funds directly from a given bank account to another. This is contrary to the use of cash or cheque.¹ Electronic banking is entirely an automated service for products availed to banking customers. The services offered through e-banking include among others, access to accounts, ability to move customers' money between different accounts, as well as to make payments via electronic channels. Despite the conventional belief that e-banking is the round-the-clock access to cash through an automated teller machine (ATM) or direct deposit of paychecks into a bank account, it as well encapsulates many types of transactions, responsibilities, rights, and fees.

Financial performance is described as the ability of a firm to manage and control its own financial resources. It involves the collection and allocation of funds or finances and is operationalized by liquidity, solvency, efficiency, leverage, capital adequacy, leverage, and profitability.² It is also stated that financial performance majorly reflects the outcomes and results of business sector which shows overall financial health of a given sector over a particular duration of time.³

Significant differences exist among banks in terms of their e-banking capabilities. These differences can take two main dimensions. The first is the use of electronic channels and the second is the sophistication of banking services delivered over an electronic channel. Many established banks in developed countries began with ATMs and evolved through Personal Computer-banking, Telephone banking, Internet-banking, TV-banking, and Mobile-banking. However, this evolution is not visible in recently established banks and in most of the African countries with the exception of South Africa. It appears that e-banking has dawned in Africa with internet banking.⁴ In subsequent years, the continent especially the Sub-Saharan Africa (SSA), has witnessed

rapid growth of electronic banking penetration. By year 2014, SSA ranked only behind Europe and Asia-Pacific regions in terms of successful mobile banking penetration. By 2015, mobile broadband connections stood at 24 per cent, a fact that resulted in increased data growth and consequential increase in revenues as well as operator investments.⁵

The onset of digital banking in Kenya is reflected in the launch of M-Shwari platform in 2012. Since then, there are several other digital platforms that offer similar services which have emerged. According to the Central Bank of Kenya (CBK), the rolling out of digital banking platforms was orchestrated by the pervasiveness of the internet as well as the readily available smartphone devices to customers.⁶ The digitization of the banking processes has consequently diminished the necessity to visit brick-and-mortar branches to access pertinent services. Notably, there are several services which are offered to customers on the mobile application and web platforms. These include account opening, balance enquiry, payment of bills, cross-platform transactions, and also loan application and disbursement.⁶

Statement of the Problem

Electronic banking is one of the major advancements of human technology. In saving time and money for users, banks offer online banking as a less expensive alternative to branch banking. Commercial banks are enterprises whose primary objective is to maximize their financial performance. However, this objective has not been achieved in its entirety. Albeit the fact that, the listed banks, except the National Bank of Kenya (NBK), recorded positive financial performance over the period spanning 7 years, that is, from 2014 to 2020, their financial performance has been decreasing consistently as reflected in the declining ROE over the aforesaid financial period.^{7,8}

The declining financial performance is against the backdrop of increased adoption of e-banking particularly in Kenya. Despite the rapid growth of e-banking, the current research has not received adequate attention. At the same time, the contributions of e-banking, particularly internet banking, to the financial performance of the banks which have adopted the technology is hitherto not clear. This leads to the big question: To what extent does internet banking influence financial performance of commercial banks especially the ones listed at the NSE? This study sought to address this research question.

Objective of the study

To determine the effect of internet banking on financial performance of listed commercial banks in Kenya

Research Hypothesis

H0: There is no significant effect of internet banking on financial performance of listed commercial banks in Kenya.

Innovation Diffusion Theory

The innovation diffusion theory was proposed by Everett Rogers and is captured in his book titled 'Diffusion of Innovations' which was last reviewed in 2003. The development of this theory was in response to sociologist Robert K. Merton's call on communication and practical implications of innovations.⁹ The theory was developed in 1962 and seeks to explain why, how, and the rate at which a product or service or process spreads through a given population of social system. Interpretively, innovation diffusion demonstrates the rate at which new ideas and/or technologies spread. It is important to reckon that the adoption of a new product, service, idea or technology takes time and does not occur simultaneously across all people in a social system.

Essentially, there are five categories of people or entities that exhibit varying characteristics subject to when they adopt an innovation. They fall under the categories of innovators, early adopters, early majority, late majority, and laggards respectively. According to Rogers, the proportionate distribution of the aforesaid adopters is 2.5%, 13.5%, 34%, 34%, and 16% respectively. Notably, the laggards constitute a larger proportion than the innovators on either side of the spectrum. The underlying concepts espoused by this theory are diffusion and innovation. Diffusion is described as a social process which takes place in response of a given innovation. As such, it involves an innovation that is conveyed through specified channels over time and amongst members of a social system.¹⁰

The success of innovation diffusion is dependent on how short or long the diffusion process is. It is thus important to understand the characteristics of each category of adopters in order to know how they can be influenced to fast-track the adoption of technology or innovation (electronic banking). Accordingly innovators are risk-takers who are price-insensitive and have the capacity to withstand high levels of uncertainty.¹⁰ They are very important to the success of new innovations since they help it to gain acceptance in the industry. Early adopters wait upon the innovation to undergo some review before they embrace it. The early majority are not risk-takers and wait upon the innovation to be tested. They only embrace and commit their resources to only those innovations which are proven to work. Late majority are risk-averse and are ordinarily skeptical towards

technology. They only adopt technology due to the pressure from their peers in the industry. The last adopters are the laggards who resent change and only adopt a new technology when they are obliged to do so.¹¹

Electronic banking is one of the technologies that has increasingly impacted the entire banking sector. Since its introduction, its adoption has received mixed reactions and criticism over time. The innovation diffusion theory has been criticized on different fronts. The results of an analysis of field data sourced from a study on diffusion of electronic data interchange, indicated that analyses based on this theory miss some crucial aspects in the diffusion of complex technologies.¹² The innovation diffusion theory is associated with clear and measurable features.¹³ However, the definition of innovation and its diffusion invokes several challenges.¹² It is not apparent whether or not all features that influence behaviour of adopters are addressed.¹⁴ There is also the issue of why should all technological innovations demonstrate the same set of attributes. Another shortfall is lack of clarity on the roles played by various characteristics of innovations at different stages of diffusion.¹⁵

Irrespective of the several criticisms the innovation diffusion theory has received, its application in the banking sector is viable. Virtually, all commercial banks, listed or otherwise, have fully integrated e-banking in their operations. As part of electronic commerce, the global banking industry has been influenced by the technological changes embodied in e-banking.¹⁶ The aforesaid underpins the importance of Rogers' innovation diffusion theory in explaining adoption of e-banking among the listed commercial banks in Kenya. As such, this theory addresses the objectives which sought to address the effect of mobile banking, automated teller machines, debit cards, and internet banking on financial performance of listed commercial banks.

Empirical Review

A study carried out in the United States sought to establish the effect of internet on both the output and performance of community banks.¹⁷ The objective was to examine the effect of the internet on banks' output and performance. The study relied on data collected from the aforesaid banks for the period from 1999 to 2001. The findings of the study indicated that the internet did not enhance the performance of the community banks. Additionally, it was observed that, it neither reduced nor enhanced the risk profile of the banks. Yet, the results indicated that the adoption of the internet improved the banks' profitability particularly through increased revenues from deposit service charges.

In the case of Kyrgyz Republic, a study was carried out on financial performance of commercial banks in the country.¹⁸ To investigate, using empirical evidence, the financial performance of commercial banks in the Republic of Kyrgyz. The study was delimited to data covering the period 2008 to 2014. The financial performance was measured using return on assets (ROA) which was estimated using regression analysis. The factors that were assessed relative to ROA included credit risk, bank size, asset management as well as operational efficiency. The results of the study indicated that operational efficiency, and asset management did not have statistically significant effect on ROA of the aforementioned banks. It was concluded that the aforesaid constructs had a negative impact on the financial performance of commercial banks.

A study conducted in Tunisia empirically analyzed the adoption of internet banking in the country.¹⁹ The objective of the study was to establish, through empirical analysis, the factors that influenced the intention to use internet banking in Tunisia. The study employed a total of 284 self-administered questionnaires to collect the relevant data. According to the study findings, perceived usefulness as well as perceived ease of use had potential effect on the intention of bank customers to employ internet banking. It was also revealed that security, privacy, and self-efficacy of customers influenced the customers' perceived ease of use.

In Kenya, a study was conducted on the effects of internet banking on financial performance of listed commercial banks.²⁰ The objective was to establish the effect of internet banking on the financial performance of the aforementioned banking institutions. A descriptive survey design was used. Simple random sampling techniques was employed to obtain the respondents of the study. Descriptive as well as inferential statistics were used in analyzed the data that had been collected by use of questionnaires. The major findings of the study were that there existed a positive influence of internet banking on the various components of banks' financial performance such as operating costs, loan book, customer deposits and incomes. Pertinently, it was recommended that the bank managers ought to put more emphasis on training the bank customers on how to use internet banking. The aforesaid managers were also advised to ensure that there is tight security of data and information used on the internet banking platform.

A local study examined the determinants of financial performance of commercial banks listed on the Nairobi Securities Exchange.²¹ The objective was to examine the determinants that affected financial performance of listed commercial banks in Kenya. The determinants were capital adequacy, liquidity, operational expenses, and leverage. The study adopted a descriptive research design. The 11 listed commercial banks as at December 31, 2016 were involved in the study. A representative sample of 71 respondents participated in the study. The results of the study revealed that all the aforesaid determinants significantly influenced financial performance of the listed commercial banks with the leverage having the strongest influence.

Conceptual Framework

A conceptual framework is a research tool intended to assist a researcher to develop awareness and understanding of the situation under scrutiny and to communicate it. When clearly articulated, a conceptual framework has potential usefulness as a tool to assist a researcher in making meaning of subsequent findings. It forms part of the agenda for negotiation to be scrutinized, tested, reviewed and reformed as a result of investigation since it explains the possible connections between study variables.²²Contextually, the conceptual framework shown in Figure no 1 illustrates that internet banking and financial performance are the independent and dependent variables respectively. Volume of transactions and the amount transacted are the indicators used for internet banking while return on equity (ROE) is the metric for financial performance of listed commercial banks.

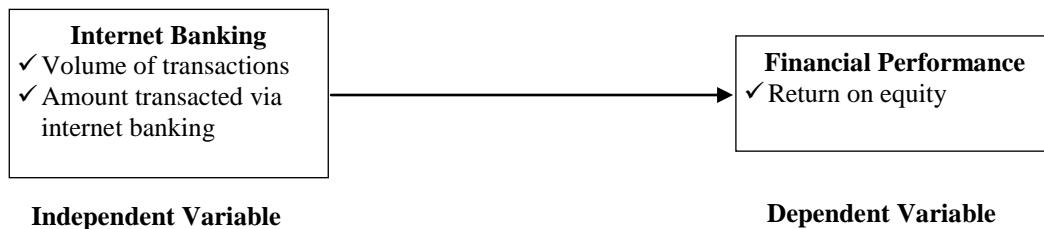


Figure no 1: Conceptual Framework

II. Material And Methods

Research Design

The study adopted an explanatory research design which defines a subject, often by creating a profile of a group of problems, people, or events, through the collection of data and tabulation of the frequencies on research variables or their interaction. This is part of a quantitative research design, whose aim is to determine the relationship between an independent (explanatory) variable and another dependent or outcome variable in a population, establishing the associations between variables and the causality.

Target Population

The target population refers to the entire group of people or objects of interest that the study wishes to investigate.²³The target population constituted all commercial banks in Kenya. However, it was narrowed down to the 11 listed commercial banks operating in the country which constituted the accessible population. These banks included ABSA Bank, Cooperative Bank of Kenya, DTB, Equity Bank, I & M Bank, KCB, National Bank of Kenya, NCBA, Stanbic Bank, Standard Chartered Bank, and Housing Finance. The choice of these banks was founded on the fact that they are the largest in terms of assets and, essentially, have adopted and fully integrated mobile banking into their financial operations.

Sampling Procedure and Sample Size

Sampling refers to the process of selecting a representative proportion of the study population.²⁴A sample of 11 commercial banks was obtained from the sampling frame encompassing all the 42 banks licensed by the Central Bank of Kenya as at 2020. Purposive sampling technique was employed to draw sample whereby the criterion for selection was that the banks had to be listed on the Nairobi Securities Exchange. The 11 commercial banks were deliberately selected on the premise of them being listed on the NSE.

Data and Research Instrument

For the purpose of this study, only secondary data were used. Secondary data were collected from the websites of the 11 listed commercial banks as well as the CBK's bank supervisory reports for the financial years under study using a structured data collection sheet. The archival research strategy, about which the secondary data analysis is founded, allows addressing questions that centre on the past and which change over time whether they are descriptive, explanatory or exploratory.²⁴

Validity and Reliability

Secondary data may be prone to both validity and reliability challenges which can consequently compromise the viability of the overall research.²⁵This prompted the necessity of ensuring that the secondary data were obtained from authentic sources. The aforesaid was premised on the fact that, unlike in the case of primary data, there are hitherto no verifiable or apt tools for assessing both the validity and reliability of secondary data.²⁶ In this respect, the secondary data regarding electronic banking and financial performance of the listed commercial banks in Kenya were obtained from the audited financial reports uploaded on the official websites of the respective banks as well as Central Bank of Kenya's bank supervisory reports.

Data Analysis and Presentation

The collected data were analyzed with the aid of the Statistical Package for Social Sciences (SPSS) version 25. The analysis involved descriptive as well inferential statistics. The former took the form of frequencies and percentages. Inferential statistics included correlation and regression analysis. The Pearson's

Product Moment Correlation Coefficient (PPMCC) was the correlation analysis adopted by the study. Panel data regression analysis was conducted. Panel data encompass a combination of cross-sectional and time series data. Such data refer to a two-dimensional concept that involves same objects or aspects or entities being observed repeatedly over different time periods.²⁷ Therefore, in arriving at estimates, composite scores were used in respect of each study variable. The cross-sectional aspect was reflected in the 11 listed commercial banks while time series dimension was demonstrated by the 7 financial years over which the pertinent data were collected. Simple linear, multiple linear, and moderated regression analyses were adopted in the panel data analysis. It is important to note that prior to conducting inferential statistical analyses, pertinent diagnostic tests were carried out. The tests were in respect of assumptions for linearity, multicollinearity, normality, homoscedasticity, and autocorrelation. The null hypotheses were tested at p-value = 0.05. The following is the simple linear regression model that guided the analysis.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Where

- Y = Financial performance
- B₀ = Constant of regression coefficient (y-intercept)
- B₁=Regression coefficient of the independent/explanatory variable
- X₁= Internet banking
- ε = Error term of the regression model

The results of the data analyses were presented in tabular and graphical formats

III. Results

Results of Descriptive Analysis

In this section, the findings are presented in absolute figures as documented in the financial reports of the respective listed banks. It is important to note that not all projected data or statistics were readily available from the aforesaid reports.

Internet Banking

Granted that banking institutions have continued to embrace technology in their operations, the study determined the extent to which commercial banks listed on the NSE transacted through the available internet platforms. The results relevant to internet banking are presented in Table no 1.

Table no 1: Descriptive Statistics on Internet Banking

FY	Volume of Transactions (000)	% deviation	Amount Transacted (million)	% deviation
2014	3672		130.00	
2015	4192	14.16	167.30	28.69
2016	5246	25.14	289.81	73.23
2017	2859	-45.50	372.90	28.67
2018	3633	27.07	5247.98	1310.24
2019	4488	23.53	2881.99	-45.07
2020	6141	36.83	2943.00	2.12

Notably, majority of listed banks did not separate internet and mobile banking transactions. They reported both together or in combination with other non-interest income channels such as agency banking and facilitation fees and/or commissions. As such, the results captured in Table no 1 are reflective of the listed banks that clearly presented internet banking transactions on their financial reports for the respective financial years. While the volume of internet banking transactions rose by a margin of 14.16% between FY 2014 and FY 2015, the amount transacted on the same channel and over the same financial period increased by 28.69%. In FY 2016, volume of transactions amounted to 5.246 million while the total amount transacted through internet banking was Ksh 289.81 million.

Although the amount transacted in FY 2017, that is, Ksh 372.90 million was higher than the amount transacted the previous year despite the volume of transactions reducing by 45.50%. This apparent and unexpected disparity arises from the uneven reporting of internet banking transactions by listed commercial banks in Kenya. For instance, in FY 2016 and FY 2017 only the Stanbic Bank out of the 11 listed banks reported on the amount of funds transacted via internet banking mainly through the electronic fund transfer (EFT). In the following financial years (2018, 2019, and 2020) only Absa Bank and Stanbic Bank captured in their financial reports the amount of funds transacted on the internet.

It was also evident that the banks that reported on the amount of funds transacted on the internet, as earlier explained, varied from the ones that reported on the volumes of the internet banking transactions. For

example, whereas the 6141 million transactions shown in Table no 1 were reported by three banks (KCB, Cooperative Bank, and DTB) in their financial reports for the financial year ending December 31, 2020, the volume of internet banking transactions were reported by Absa Bank and Stanbic Bank. This explained the disparity noted where, for instance, an increase in volume of transactions did not result in increased amount of funds transacted through internet banking.

Financial Performance

Financial performance of the commercial banks listed on the NSE was another construct of interest to this study. The metric that was focused on was return on equity, which is ostensibly one of the best and most recommended measures of financial performance. It is indicated that ROE is a popular measure of corporate financial performance.²⁸The results of financial performance of the listed commercial banks are as shown in Figure no 1.

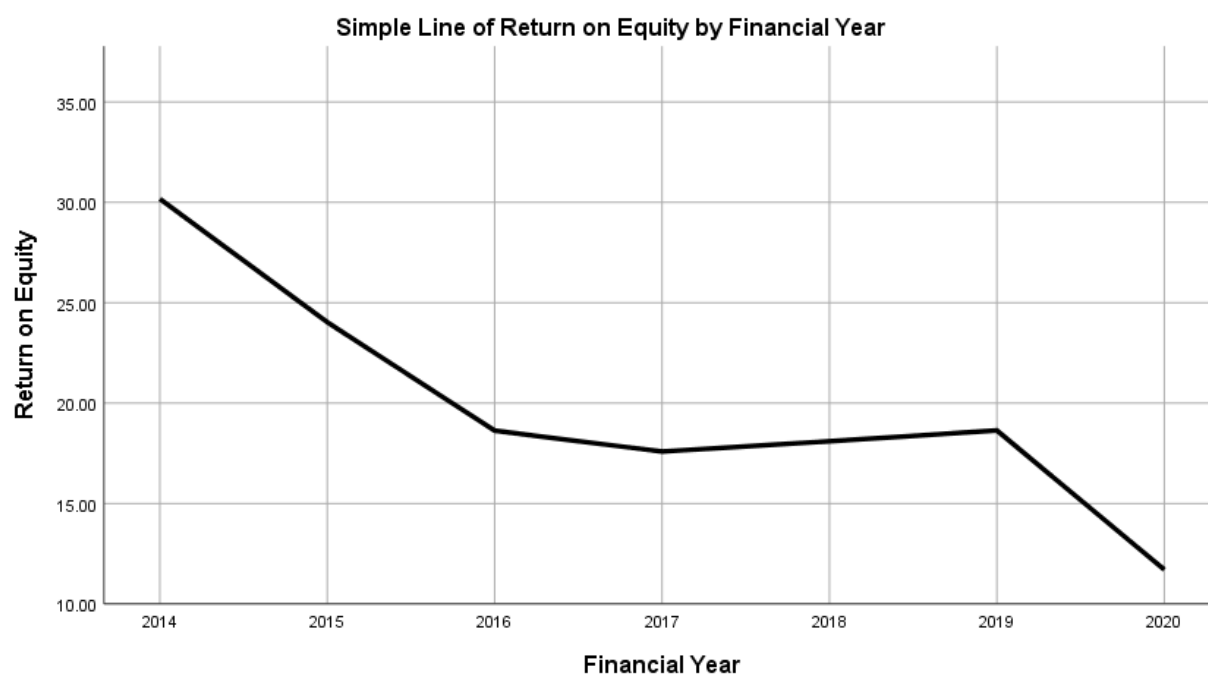


Figure no 2: Financial Performance (ROE) of Listed Commercial Banks

In tandem with the findings shown in Figure no 2, the financial performance as depicted by ROE of the listed commercial banks has, on average, been fluctuating with the highest performance (ROE = 30.17) being reported in FY 2014 while the lowest performance (ROE = 11.71) was recorded in FY 2020. The ROE of these banks prior to 2016 was significantly high due to the fact that the interest rate capping had not been introduced. Therefore, the banks were able to realize good returns from their financial activities particularly those generating interest income. In FY 2017, the financial performance was comparatively low (ROE = 17.59) majorly due to two crucial reasons.

First and foremost, it was the very first year that the interest rate capping was being implemented; a move that spelt huge foregone income interest. Given that lending is the chief source of income for lending institutions including listed commercial banks, it was obvious that capping of the lending rates curtailed the lending patterns especially to individuals, micro, small and medium enterprises. Consequently, the interest income reduced significantly leading to reduction in ROE. The second reason is founded on the fact that, Kenya was holding its General Elections which were, to a considerable extent, hotly contested. This had, expectedly, negated the financial performance of many enterprises including commercial banks.

The highest financial performance since 2016 was reported in FY 2019. This could have been attributed to the fact that the lending interest rates capping were repealed in the last quarter of that year. Therefore, albeit for a short period, the listed banks enjoyed flexibility in determining the lending rates that suited their financial objectives. They were able to widen the scope of qualified borrowers hence increasing their loan portfolios. Another reason is the fact that, the banks had started getting accustomed to the interest rate capping introduced over the preceding two years. The political temperatures in the country had significantly

subsidized particularly at the national level. This factor created an ample business environment for the listed banks to operate. The FY 2020 saw the listed commercial banks reporting their worst financial performance reflected in their lowest ROE of 11.71 over the period of five years beginning 2016.

Inferential Statistics

The indicators that were used to represent each of the variables, that is, internet banking, and financial performance are illustrated in Table no 2.

Table no 1: Study Variables and Indicators Used in Inferential Statistics

Variable	Indicator/Metric
Internet banking	Amount transacted
Financial performance	Return on Equity (ROE)

The choice of the indicators or metrics used to represent the study variables in inferential analysis was based on their consistency in the financial reporting of the 11 listed commercial banks operating in Kenya as at 2021. The total amount of funds transacted through internet banking represented internet banking respectively. The ROE was employed as the measurable indicator of financial performance.

Linearity Test

The collected data were tested to assess whether or not the linearity assumption had been achieved. It is indicated that in parametric statistics where more than one continuous variables are involved, for instance, in linear regression, linearity between pairs of variables is assumed (Tabachnick & Fidell, 2001). The pertinent results are as shown in Figures no 3.

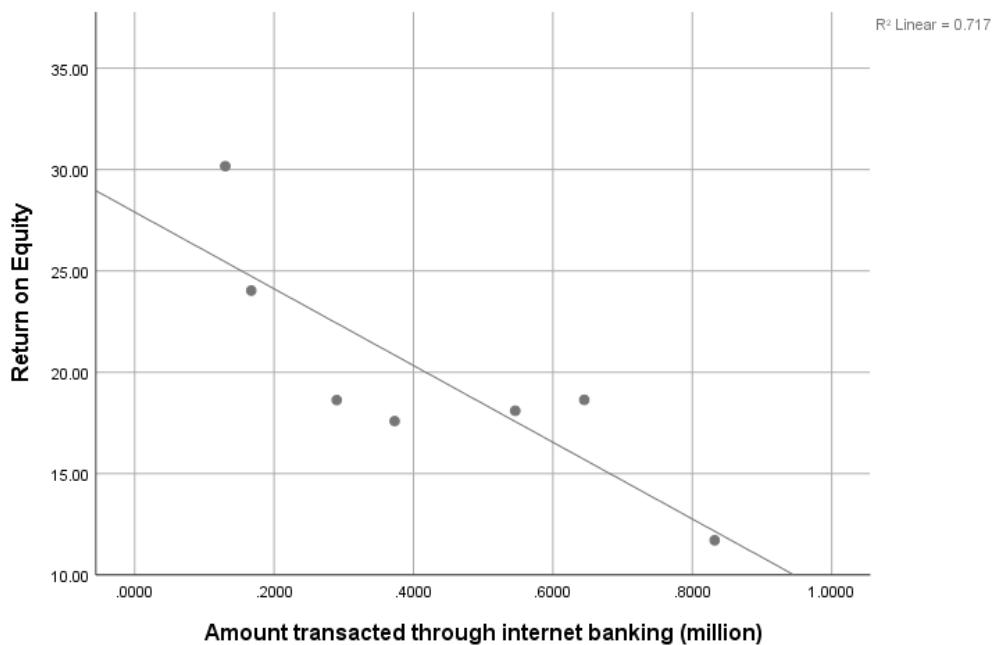


Figure no 3: Linearity Test Results for Internet Banking against ROE

As shown in Figure no 3, while one data point barely touches on the line of best fit, the other six are equally separated by the line. Hence, it was concluded that the assumption of linearity between internet banking and financial performance was affirmed.

Correlation Analysis

The Pearson’s product moment correlation coefficient (PPMCC) was used to determine the relationship between each of the independent variable (internet banking) and dependent variable (financial performance). The choice of PPMCC was premised on the fact that the data used was not only continuous but also normally distributed. It is stated that PPMCC is appropriate when either one or both variables (independent and dependent) are normally distributed.²⁹The results of correlation analysis are presented in Table no 3.

Table no 3: Results of PPMCC

		Internet banking	ROE
Internet banking	Pearson Correlation	1	-.847 ^a
	Sig. (2-tailed)		.016
	n	7	7
ROE	Pearson Correlation	-.847 ^a	1
	Sig. (2-tailed)	.016	
	n	7	7

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

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

According to the correlation results shown in Table no 4, the relationship between internet banking and financial performance was negative, strong and statistically significant ($r = -0.847$; $p = 0.016$) at p -value = 0.05. As such, increasing transactions via internet banking was likely to lead to substantial reduction in financial performance of listed commercial banks.

Simple Linear Regression Analysis

The object of this analysis was to determine the effect of internet banking on financial performance (ROE). The study examined the extent to which internet banking influenced financial performance of listed commercial banks in Kenya. The pertinent results are presented in Table no 4, Table no 5, and Table no 6.

Table no 4: Model Summary of Internet Banking against Financial Performance

Model	r	r Square	Adjusted R Square	Std. Error of the Estimate
1	.847 ^a	.717	.661	3.37470

a. Predictors: (Constant), Amount transacted through internet banking (million)

Illustratively, the results of coefficient of determination ($r^2 = 0.717$) shown in Table no 4 indicated that 71.7% of variability in ROE of the listed commercial banks could be attributed to the amount of funds transacted through internet banking. These results emphasize the importance of internet banking with regard to financial performance of commercial banks listed on the NSE.

Table no 5: ANOVA of Internet Banking against Financial Performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	144.413	1	144.413	12.680	.016 ^b
	Residual	56.943	5	11.389		
	Total	201.356	6			

a. Dependent Variable: Return on Equity

b. Predictors: (Constant), Amount transacted through internet banking

According to the F-statistics shown in Table no 5 ($F_{1,5} = 12.680$; $p = 0.016$), there was statistically significant relationship between the amount of funds transacted through internet banking and ROE at p -value = 0.05. This was interpreted to mean that sample data used fitted the adopted simple linear regression model ($Y = \beta_0 + \beta_4 X_4 + \epsilon$) linking internet banking to financial performance of listed commercial banks. Hence, it was practical to establish the extent to which internet banking influenced financial performance of the aforementioned banks as presented in Table 4.22.

Table no 6: Regression Coefficients of Internet Banking against Financial Performance

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	27.904	2.599			10.735	.000
Amount transacted through internet banking	-18.927	5.315	-.847		-3.561	.016

a. Dependent Variable: Return on Equity

In tandem with the results shown in Table no 6 ($Y = 27.904 - 18.927X_4$), 18.927 units of internet banking were required to effect a one unit change in financial performance of listed banks albeit in the opposite direction. This was possible when other factors (besides internet banking, $\beta_0 = 27.904$) were held constant. Similar to the results of F-statistics ($F_{1,5} = 12.680$; $p = 0.016$), the effect of internet banking on financial performance was established to be statistically significant ($t = -3.561$; $p = 0.016$) at p -value = 0.05.

IV. Discussion

There was low financial performance reported by listed commercial banks beginning FY 2020. This was overwhelmingly attributed to the Covid-19 pandemic whose effect started being felt in Kenya in March 2020. Therefore, for a period of three quarters, the banks, just like other enterprises, were hard hit. The operations of these banks were greatly affected with the staff being obligated by the government to work at bare minimum. The business hours also reduced significantly. The skepticism in the business environment thwarted the potential borrowers from going for loans. Additionally, there was restructuring of the existing loans where banks gave a moratorium with regard to the loan repayment. According to the CBK, in an attempt to provide relief to borrowers, banks in Kenya had restructured 54% of their total loan portfolio translating to Ksh 1.6 trillion.⁸

Coupled with the aforesaid loan restructuring the pandemic orchestrated increased non-performing loans. Consequently, the performing loan portfolio drastically reduced. Apparently, the interest income fell to an all-time low which translated to worsening of the banks' financial performance, hence the conspicuously low return on equity. ROE is described as a profitability ratio which is employed to measure the ability of an enterprise to generate profits from its shareholders' investments. Therefore, reduced any effect on profitability affect ROE as well. Against this backdrop, in FY 2020, the CBK reported that there was decreased profitability supported by the statistics that profits before tax decreased by 29.3% from Ksh 159.1 billion by end of 2019 to Ksh 112.1 billion as at December 31, 2020.⁸

The results of correlation analysis were contrary to the findings of an empirical study conducted in Spain which revealed that internet adoption positively impacted profitability of banks.³⁰ The results of simple linear regression analysis concurred with the observations made by a study carried out in the United States that, the adoption of the internet improved the profitability of commercial banks.¹⁷ On the same note, the results were corroborated by the findings of an empirical study which indicated that internet banking positively influenced financial performance of listed commercial banks in Kenya.²⁰ Therefore, it was imperative for these banks to continue putting more emphasis on the use of internet banking by their customers when transacting.

V. Conclusions and Recommendations

With regard to internet banking, the study concluded that a majority of commercial banks listed on the NSE did not separate internet and mobile banking transactions and amounts in their financial reports. The analysis of the data obtained from the banks that clearly reported on internet banking led to the inference that transactions made through the internet platforms increased consistently except in FY 2017 where substantial decrease was reported. The lack of clarity in internet banking was reflected on the disparities in the transactions and amount of funds transacted via internet, for instance, electronic funds transfer. It was also deduced that internet banking was an important dimension of electronic banking with regard to financial performance of listed commercial banks. Similar to mobile banking, there has been increased adoption of internet banking amongst commercial banks' customers. This has particularly increased during the Covid-19 pandemic as well as in the recent years when the banks have advanced their technology.

On the construct of internet banking, it was recommended that there ought to be distinct reporting on the transactions and amount of funds transacted via this platform. This would essentially enable pertinent stakeholders to make informed decisions on internet banking particularly with regard to its contribution towards financial performance of listed commercial banks. It is also advisable for commercial banks to ensure that their systems are up to the required standards as well as being competitive enough to seamlessly support internet banking. Advocacy amongst the bank customers on the essence of internet banking should be conducted with the view of increasing its adoption.

References

- [1]. Bojan, D., Mutu, S., & Paun, D. (2010). Electronic banking - Advantages for financial services delivery. 672-677. Retrieved June 24, 2021, from https://www.researchgate.net/publication/49615407_ELECTRONIC_BANKING_ADVANTAGES_FOR_FINANCIAL_SERVICE_S_DELIVERY
- [2]. Fatihudin, D., & Mochklas, M. (2018). How measuring financial performance. *International Journal of Civil Engineering and Technology*, 9(6), 553-557.
- [3]. Naz, F., Ijaz, F., & Naqvi, F. (2016). Financial performance of firms: Evidence from Pakistan cement industry. *Journal of Teaching and Education*, 5(1), 81-94. Retrieved June 25, 2021, from https://www.researchgate.net/publication/305993207_FINANCIAL_PERFORMANCE_OF_FIRMS_EVIDENCE_FROM_PAKIS_TAN_CEMENT_INDUSTRY/link/57a8de6008aef20758cd0c51/download
- [4]. Brown, I., & Molla, A. (2005). Determinants of internet and cell phone banking adoption in South Africa. *Journal of Internet Banking and Commerce*, 9(4), 1-9.
- [5]. Marybeth, R., & Grietjie, V. (2016). Mobile banking in Africa: The current state of play. In B. Batiz-Lazo, & I. Efthymiou, *The book of payments* (pp. 233-257). doi:10.1057/978-1-137-60231-2_21
- [6]. Central Bank of Kenya (CBK). (2021). *Bank Supervision Annual Report 2020*. Nairobi: Central Bank of Kenya.

- [7]. Central Bank of Kenya (CBK). (2019). *BankSupervision Annual Report 2018*. Nairobi: Central Bank of Kenya. Retrieved June 16, 2021, from https://www.centralbank.go.ke/uploads/banking_sector_annual_reports/1174296311_2018%20Annual%20Report.pdf
- [8]. Central Bank of Kenya. (2020). *Bank supervision annual report 2020*. Nairobi, Kenya: Central Bank of Kenya. Retrieved August 2, 2021, from https://www.centralbank.go.ke/uploads/banking_sector_annual_reports/1375903848_Bank%20Supervision%20Annual%20Report%202020.pdf
- [9]. Dearing, J. W., & Singhal, A. (2006). Communication of innovations: A journey with Ev Rogers. In A. Singhal, & J. W. Dearing, *Communication of innovations* (pp. 15-28). Thousand Oaks, CA: Sage.
- [10]. Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.
- [11]. Dearing, J. W., & Cox, J. G. (2018). Diffusion of innovations theory, principles, and practice. *Health Affairs*, 37(2), 183 –190. doi:10.1377/hlthaff.2017.11104
- [12]. Lyytinen, K., & Damsgaard, J. (2001). What's wrong with the diffusion of innovation theory? The case of a complex and networked technology. *Diffusing Software Product and Process Innovations*, 173-190.
- [13]. Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York, NY: The Free Press.
- [14]. Hughes, T. (1987). The evolution of large technological systems. In W. Bijker, T. Hughes, & T. Pinch, *The social construction of technological systems* (pp. 51-82). Cambridge, Mass: The MIT Press.
- [15]. Pinch, T., & Bijker, W. (1987). The social construction of facts and artifacts: Or how the sociology of science and sociology of technology might benefit each other. In W. Bijker, T. Hughes, & T. Pinch, *The social construction of technological systems* (pp. 17-50). Cambridge, Mass: The MIT Press.
- [16]. Bradley, L., & Stewart, K. (2003). The diffusion of online banking. *Journal of Marketing Management*, 19(10), 1087-1109.
- [17]. DeYoung, R. (2017). The performance of Internet-based business models: Evidence from the banking industry. *Journal of Business*, 78(3), 893-947.
- [18]. Yamaltdinova, A., & Sulaimanova, B. (2015). Financial performance of commercial banks: The case of Kyrgyz. *International Conference on Eurasian Economies*, 48-53.
- [19]. Nasri, W., & Zarai, M. (2014). Empirical analysis of internet banking adoption in Tunisia. *Asian Economic and Financial Review*, 4(12), 1812-1825.
- [20]. Mateka, M., Gogo, J., & Omagwa, J. (2016). Effects of internet banking on financial performance of listed commercial banks in Kenya. *American Journal of Finance*, 4(2), 53-71.
- [21]. Nalianya, S. N. (2020). Determinants of financial performance of commercial banks in Kenya: Cse of listed banks. *Strategic Journal of Business & Change Management*, 7(3), 880-897.
- [22]. Smyth, R. (2004). Exploring the usefulness of a conceptual framework as a research tool: A researcher's reflections. *Issues in Educational Research*, 14(2), 167-180.
- [23]. Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill building approach* (5th ed.). Somerset, NJ: John Wiley & Sons.
- [24]. Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Harlow, England: Pearson Education Limited.
- [25]. Olabode, S. O., Olateju, I. O., & Bakare, A. A. (2019). An assessment of the reliability of secondary data in management science research. *International Journal of Business and Management Review*, 7(3), 27-43.
- [26]. Flintermann, B. (2014). *The quality of market research reports: The case of marketline advantage and the automobile industry*. Master thesis, University of Twente, School of Management and Governance, Enschede, The Netherlands. Retrieved December 2, 2021, from https://essay.utwente.nl/66122/1/Flintermann_MA_MB.pdf
- [27]. Brugger, B. (2021, January 6). A guide to panel data regression: Theoretics and implementation with Python. Retrieved August 13, 2021, from <https://towardsdatascience.com/a-guide-to-panel-data-regression-theoretics-and-implementation-with-python-4c84c5055cf8>
- [28]. De Wet, J. H., & Du Toit, E. (2007). Return on equity: A popular, but flawed measure of corporate financial performance. *South African Journal of Business Management*, 38(1), 59-69. doi:10.4102/sajbm.v38i1.578
- [29]. Mukaka, M. M. (2012). Statistics Corner: A guide to appropriate use of correlation coefficient in medical research. *Malawi Medical Journal*, 24(3), 69-71.
- [30]. Nieto, M. J., & Hernando, I. (2015). Is the internet delivery channel changing banks' performance? The case of Spanish banks. *International Tor Vegata Conference*. Madrid, Spain.