

**EFFECT OF E-BANKING ON FINANCIAL PERFORMANCE OF LISTED
COMMERCIAL BANKS IN KENYA**

MARY OGUTU

**A DISSERTATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE
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DECLARATION

I declare that this project is my original work and has not been previously published or submitted elsewhere for a ward of degree. I also declare this contain no material written or published by other people except where due reference is made, and author duly acknowledged.

Name: MARY OGUTU

REG NO:

Sign **Date.....**

I hereby confirm that I have examined the masters' project of

Mary Ogutu

And approved it for examination

Sign.....Date.....

Dr. FATOKI O. ISOLA (PhD)

Dissertation supervisor

ABSTRACT

The objective of this study was to examine the effect of electronic banking on financial performance of listed commercial banks in Kenya. This study was guided by four objectives, establishing the effect of mobile banking, agency banking, ATM banking and online banking on financial performance of listed commercial banks in Kenya. The study employed quantitative research design using panel data analysis. The targeted population of the study was the 11 listed commercial banks in Kenya. Secondary data was extracted from CBK banking supervisory reports and published annual reports of banks. The data was recorded on data collection sheets. Both descriptive and inferential statistics were used. The findings were presented using tables with associated explanations. The study found that there was strong positive relationship between mobile banking, agency banking, ATM banking and online banking and financial performance of listed commercial banks in Kenya. Financial performance of commercial banks and m-banking were strongly and positively correlated. There was a strong positive correlation between financials performance of individual commercial bank and agency banking. There was a strong positive correlation between financials performance of individual commercial bank and agency banking. There was a weak positive correlation between financial performance of individual commercial bank and online banking.

Keywords: Electronic banking, mobile banking, online banking, ATM banking and Agency banking.

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DEDICATION

I would like to dedicate this study to my family for their support

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ACRONYMS AND ABBREVIATIONS

ANOVA	Analysis of Variances
ASP	Application Service Providers
ATM	Automated Teller Machine
CBK	Central Bank of Kenya
E-Banking	Electronic Banking
EFT	Electronic Funds Transfer
ICT	Information, Communication Technology
IT	Information Technology
KEPSS	Kenya Electronic Payment and Settlement system
N.S.E	Nairobi Securities Exchange
PC	Personal Computer
POS	Point of Sale
ROA	Return on Assets
ROE	Return on Equity
SMS	Short Message Service
TAT	Technology Acceptance Theory

OPERATIONAL DEFINITION OF TERMS

- Agency Banking** : According to Aduda and Kingoo (2013) is an agent contracted by bank to offer retail network as a banking agent.
- Automated teller machine (ATM)** : ATM is a computerized tools used by bank to enable customers to have access to their finance without interacting with employees of the bank and also at any time (DeYoung, 2005).
- Commercial bank** : it is an institution which provides services dealing with finances like giving business loans, accepting deposits, basic investment products. Traditionally commercial bank has been a brick and mortar financial organization with safe boxes, ATMs, tellers and vaults (Business Dictionary, 2011).
- Financial performance** : Financial performance is an indicator used to establish how well the organization is using its assets in its main business to generate income. Financial performance also describes the overall financial health of an institution over a given period of time (Business Dictionary, 2011).
- Internet banking** : this is a computer system which makes it possible for people to carry out banking practices by use of the internet (Atanassov, Nanda & Seru, 2007).
- Mobile banking** : Mobile banking is financial innovation that makes it possible for clients to transact finances via a mobile device (Boston Consulting Group, 2009).
- Online Banking** : Okiro and Ndungu (2013) define online banking a system that enables bank customers to perform a wide range of transaction on online platforms.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The kind of revolution in IT that has affected all facets of life has been in so characterised by adjustments globally especially players in the banking industry. The invention of e-banking has changed and redesigned the practice of banking. Technology at the moment is considered as one the major contributor to the success of firms as well as other core competencies. Study by Yaklef (2001) discovered cost minimization as a critical benefit that banking institutions derive from use of technology in banking. The need to minimise cost of operation and administrative costs of banking has pushed commercial banks to adopt the electronic banking world over. However, cost minimization can only be realised with improved adoption of technology inform of mobile banking by customers of the bank (Bradley & Stewart, 2003).

E-banking is the adoption of telecommunication networks and internet to offer a wide variety of products that are value laddered to commercial bank clients. Internet banking may also involve importation of data to personal accounting software. Some of the e-banking makes it possible for bank clients to monitor their own accounts from the bank or from other places. Banking using the internet is regarded as a complementary channel used in service delivery. Based on ATMs being introduced, phone banking, PC banking that is the building blocks of initial electronic finance, the improved usage and diffusion of online banking has introduced a new channel of distribution to retail banking. Online banking has increased acceptance in the entire world as a new channel of delivery to perform a number of banking transactions. Additionally, online banking provides an avenue for banks clients to carry out bank's transactions within their comfort (Yaklef, 2001).

There exist two approaches of offering Internet banking worldwide. Firstly, a bank that is existing can come up with a website and then goes ahead to give online banking in addition to its traditional channels of delivery. Secondly, a bank may decide to come up with an internet only or "branchless or "virtual" bank (Steven, 2002). The Internet banking also aids commercial banks in penetrating and expanding their services into other financial markets

without the need for brick and mortar. Due to the availability of e-banking worldwide, there is an expectation of mixtures on the products that the bank offers, ways of delivering services to clients and how the banks perform. Internet banking have made is possible for Banks to better serve their vast clients by making sure that the services they are given are fast, of good quality, efficient and are convenient to them. Online banking is also argued for creating and improving banks revenue and hence profitability. Additionally, industry players and analysis also state the possible effect of online banking on cost savings efforts. Internet banking has also affected risk profile of the commercial banks (Berger, 2003).

The first time e-banking was invented was in mid-70s. Despite its invention, there were no users of internet services because of the high cost of internet services and therefore, e-banking experienced stunted growth. By late 90s more people started embracing the use of internet to make transaction; this is when e-banking experienced a boom. As internet usage grew so did e-banking. There was tremendous growth in the use of internet but still the number of people willing to make money transfers using the internet remained low; people were still hesitant. E-commerce was greatly adopted because of the innovativeness of businesses like AOL, Amazon and eBay who made online buying common thing. By the year 2000, more than 80% of banks located in America were offering online bank services but still the growth was slow. For example, it took about 10 years for the Bank of America, to acquire 2 million clients using e-banking.

Recently, banks in Nigeria are experiencing great success in terms of them delivering variety of value added products and services via e-banking; this has led to increased acceptance of e-banking (Agboola, 2006; Ayo, 2010). Idowu, Alu and Adagunodo (2002) indicated that Nigerian banks have established that by using technology, they are able to gain competitive advantage and overdo their competitors. Therefore, there is tremendous rate of adoption of technology in the banking sector in Nigeria (Salawu & Salawu, 2007). Despite the high adoption rate of e-banking, it does not mean that it improves the performance of the banks or that of the country's economy. There is need to have parameters that can measure the performance of the banks over a specified period of time after he adoption of e-banking.

In Kenya the use of ATMs was among the first and widely embraced e-banking services (Nyangosi, 2009). The annual reports provided by CBK indicated that, in the recent past, the use of ATM has been overtaken by the use of m-banking services (CBK, 2012). Currently, it is estimated that 8 million people use M-banking services. There has been an overwhelming increase in the number of m-banking users; this is because of the increasing number of mobile users and the fact that it is easy to use the services. The partnership between financial institutions and non-financial institutions has been on the increase; customers are able to pay their bills in e-commerce platforms using e-banking services via a shared bank platform.

1.1.1 Electronic Banking

A number of definitions exist on electronic banking. Generally, Electronic banking is the adoption of electronic devices to offer services of the bank primarily via the Internet. Electronic banking also refers to telephone banking, plastic money, ATMs, Electronic Funds Transfer (EFT) and mobile phone banking (Simpson, 2002). E-Banking makes available a variety of online services including request for chequebooks, balance enquiry, balance transfer instructions, and opening of an account. Using online banking, bank customers can confirm their balance and make payments electronically without the assistance of physical bank staff. Electronic banking is slowly creating a cashless society where people do not have to carry cash. For instance, bank clients are able to make payment for tickets and purchase financial assets by simply transferring the money directly from their accounts via electronic transfers of credit to the sellers (CBK, 2017).

Electronic banking has a number of embodiments include the following: Electronic funds transfers, Self Service (PC) Banking, Telephone Banking, Mobile/SMS Banking, Branchless Banking, POS Banking, ATMs and Interactive TV, for example Kenya has M-Shwari which is a product offered by CBA together with mobile phone company Safaricom. M-Shwari, which is a game changer in the banking service, offered to M-PESA users that enable customers to borrow and save money via the mobile phone and earn interest on money saved. M-Shwari is a paperless banking product offered via M-PESA that makes it possible for a client to open and operate an account via a cell phone without necessarily going to the bank to fill the forms required in opening an account. The M-shwari account gives the operator the

ability to transfer money free from and out of the saving account in M-Shwari to their Mpesa account (CBK, 2012).

1.1.2 Financial Performance

It is part of management of finance that's very important and therefore it can't overemphasize. An organization cannot discard comprehensive financial performance; otherwise the firms will close/fall. The capability of a firm to be successful in financial matters is depends on the capability of the organization to manage its financial matters effectively and efficiently. Research has given the evidence of a direct association between activities including planning, maintaining of proper financial records, procurement and financial performance that is a success (Ismaila, 2011). To determine if the firm is capable of achieving its financial aims, it is crucial for it to check how it's performing financially.

There are a number of indicators that a firm can adopt to enable it to measure their financial performance. One of the methods a firm can employ to measures its financial performance is the liquidity measures that establishes the capability a firm to achieve its financial requirements affecting negatively any of its normal duties. Liquidity measures rely on the association of assets and liabilities of a firm (Nyangosi, 2009). The next kind of measure of financial performance is solvency measures. Solvency describes the amount of funds or capital borrowed that is used by the business firm relative to the amount of owner's net worth invested in the business firm. Solvency measures are an indicator of the ability of the business to pay back all its debts with its assets (Ismaila, 2011). Another measure of financial performance is profitability measures including ROA and ROE. Profitability indicators are very useful in measuring the capability of a business firm to come up with enough profits from the assets invested in the business.

The banking industry in Kenya has undergone significant growth in terms of deposits, assets, profitability and product offerings mainly due to automation of services and branch networks expansion both locally and regionally. This growth has attracted new entrants into the sector as well as increased competition among existing players (Muiruri & Ngari, 2014). CBK

report of 2015 (CBK, 2015) indicate that “the banking sector is made up of 43 commercial banks, 1 mortgage finance company, 12 microfinance banks, 8 representative offices of foreign banks, 86 foreign exchange bureaus, 14 money remittance providers and 3 credit reference bureaus, 11 of the 43 banking institutions are listed on the Nairobi Securities Exchange” (Appendix IV). The 2017 report indicated that “Performance of the banking industry has improved in 2017, evident from the size of total assets at Ksh. 3.64 trillion, gross loans of Ksh. 2.20 trillion and a deposit base of Ksh. 2.61 trillion” (CBK, 2017).

1.2 Statement of the Problem

With the rising cost of doing business in general, and banking business in particular, most banks find themselves grappling with high costs and wastages or inefficient use of resources. The problem is even made worse with increased competition in banking industry as banks scramble for customers. Additionally, banks in Kenya must find ways to cut down costs due to reduced revenue expected with the interest rate capping law among other challenges. One way of cutting, down on costs is embracing electronic banking.

Studies show that electronic banking has a number of benefits to commercial banks especially on cost efficiency. Ugwueze & Nwezeaku (2016) studied the association of e-banking and how commercial banks in Nigeria performed. The findings showed that Point of Sale is not related to both time deposits and the savings but are related with demand deposits. The findings in Nigeria cannot be generalised to Kenya. Maiyo (2013) studied on how e-banking influenced how Kenyan commercial banks performed financially, establishing that embracing e-banking banking has improved how Kenyan commercial banks performed from a rise in effectiveness, efficiency and productivity. Kiragu (2017) also studied the how electronic banking effected how Kenyan commercial banks performed financially finding that the profits of the commercial banks have increased exponentially on embracing e-banking by the respective commercial banks. This study was conducted on all commercial banks in Kenya; the current study will focus on listed commercial banks. Another study by Asia (2015) analysed what E-banking contributed on financial performance of Institutions carrying out banking activities in Rwanda. The study found out that e-banking systems had a

major effect on how banking industries performed. This study focused on all financial institutions including the micro finance firms.

According to the CBK report in 2016, Kenya Electronic Payment and Settlement System (KEPSS) and East African Payment System (EAPS) recorded 2.855 million dealings worth Kshs. 27,002 billion in 2016, compared to 2.240 million transactions worth Kshs. 24,311 billion in 2015. This was 30% and 12% growth in volume and value respectively. The report further revealed a 12% reduction in the average amount transacted Kshs 10.9 million to Kshs 9.56 million. There was an increment of 27% in the average number of transactions moved each day from 8,954 to 11,413 dealings. The increase was attributed to the integration of KEPSS and EAPS.

From the previous empirical studies done locally and internationally, there still exist gaps in literature. The previous studies omitted a number of important dimensions of electronic banking that affect performance of commercial banks with most studies choosing to focus on only a few dimensions of electronic banking. Additionally most studies did have been either case studies of specific banks or survey of all commercial banks. There is no known study in Kenya that has considered the dimensions of electronic banking of interest in the current study among the listed commercial banks in Kenya. The current study therefore sought to bridge this gap by examining the effect of electronic banking on financial performance of listed commercial banks in Kenya.

1.3 Objectives of the study

1.3.1 General Objective

To examine the effect of electronic banking on financial performance of listed commercial banks in Kenya.

1.3.2 Specific Objectives

1. To establish the effect of mobile banking on financial performance of listed commercial banks in Kenya.

2. To assess the effect of agency banking on financial performance of listed commercial banks in Kenya
3. To determine the effect of automatic teller machine banking on financial performance of listed commercial banks in Kenya
4. To examine effect of online banking on financial performance of listed commercial banks in Kenya.

1.4 Hypotheses of the Study

H₀₁: Mobile banking has no significant effect on financial performance of listed commercial banks in Kenya.

H₀₂: Agency banking has no significant effect on financial performance of listed commercial banks in Kenya

H₀₃: ATM banking has no significant effect on financial performance of listed commercial banks in Kenya

H₀₄: Online banking has no significant effect on financial performance of listed commercial banks in Kenya.

1.5 Justification of the study

Even though the rapid development of IT has enabled banks to achieve efficiency and effectiveness in their tasks and carry out technological investments, investment in IT is taking the lion's share of commercial bank's resources hence risks associated. Now than never, other than personnel costs, investment in technology is the largest element in the commercial bank budgets and is growing so fast compared to other costs of the banks. Another evident and contemporary problem associated with electronic banking is electronic banking fraud especially on stolen and lost electronic cards as well as counterfeit card fraud. Commercial Banks must control the costs and risks that are related with e-banking. Its therefore necessary and paramount that investment in e-banking banking are made only after a thorough sound risk analysis and costs associated with the financial innovation in a bid

eliminate any negative effect of such risks on the financial performance of the commercial bank (Davenport 2003). Commercial banks find themselves face with two opposing results of technology adoption in banking. On one hand, is the efficiency and effectiveness associated with e-banking while on the other hand are losses and risks associated with e-banking. The banks must find a way of balancing these two options to improve it overall prosperity.

1.6 Significance of the Study

The study is timely and generates information that is useful to a number of groups of stakeholder in the banking industry, including the management, regulatory authorities and researchers in the banking sector. The management of listed commercial banks might find the report useful in identifying how they can use electronic banking to increase how their respective banks perform the financially. The CBK, which is a regulator of commercial banks in Kenya, might find the study useful in developing regulations to improve electronic banking, banking adoption so as to have a rise in how listed commercial banks perform financially. Additionally, the Communication Council of Kenya (CCK) might find the study useful in coming up with policies of ensuring electronic banking penetration. Lastly, the ministry of information technology (ICT) might find the study insightful in developing ICT platform that will encourage e-banking.

1.7 Scope of the Study

The study was interested in identifying the impact of e-banking on how listed commercial banks in Kenya performed. The study was a census study. The target population for this study was 11 listed commercial banks licenced by CBK and Nairobi Securities Exchange (NSE) that operated between 2013-2017. Data was mainly collected from the CBK annual bank supervisory reports and audited financial statements of respective banks in the study.

1.8 Limitation of the Study

In attaining its objective the study was limited to eleven commercial, banks listed in the NSE. Secondary data was collected from all the CBK and bank financial reports available. The study was limited to the precision of the data gathered using secondary sources. Verification

of the data was done since it came from the company publications; it nonetheless could still be prone to these shortcomings. The research study was limited to examine the effect of e-banking on financial performance of listed commercial banks in Kenya. The study period was 5 years; from 2013 to 2017. The time period was short, longer periods would have captured various periods with different economic significances. This would have provided a broad dimension of problems.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter elaborates on theoretical review, empirical review, research gaps, conceptual framework and operationalizing of the study operationalization of variables.

2.2 Theoretical Review

2.2.1 Transaction Cost Theory

The basic idea that transactions are part of economic thinking was first introduced by Commons (1931) who argued that that individual activities are essentially transactions in nature instead of being personal character or even exchanging of items in the economic system. the shift from thinking that is commodity in nature to thinking that is transactions in nature and the working rules that are collective action forming the foundation for change from the classical and hedonic schools to the institutional schools of economic thinking. However the term "transaction cost" was initially introduced by Coase (1960), who employed it to come up with theoretical framework for estimating when some specific economic roles would be done by organizations, and point in time when the economic tasks would be done on the market. The cost of transacting kind of thinking was populised in the works of (Oliver, 2009). The Transaction cost economics is used. Oliver (2009) to examine some of distincive behaviours in the economic system. Transactions cost economics essentially includes putting into consideration transactions not only the usual cases of buying and selling, but also includes day-to-day emotional involvements, exchanging of gifts informally, etc.

As put forward by Khan and Hildreth (2004), transaction cost theory is a crucial theoretical view in use in management theory of finances for two major reasons that is the widely accepted value of efficiency in this area and the ambiguity of transactions. In theory, ecpnomic revenues can be gathered using three main types of contracts of revenue collector and revenue gathering authorities. The contracts includes wage, share and fixed-rent

contracts. Wage contracts implies that the government of the day involves revenue collection agents in revenue collection for a fixed wage, and the revenue collection agents accepts to bring over to the government all the revenues collected by them. The Share kind of contract is a kind of contract in which in lieu of a wage payment, the agents who are responsible for collecting wages holds a share that has been specified before of the revenues gathered to serve as their wages for the services offered to the government in revenue collection. Fixed rent contracts is a kind of contract where revenue collection agents accepts to pay a pre specified sum of money out of revenue collected to the government; in turn for right to the rest of the revenue (Kahneman & Tversky,2013). In advent of 19th century, the fixed-rent kind of contract was the most common type of revenue gathering contract while the wage kind of contract is the most common kind of contract in use in revenue gathering by the government of the day in the modern systems such that other techniques of gathering revenue are seen as anomalous.

Most issues in management of expenditure contrast in nature. Expenditure management is a 3 pronged processes including administrating procedure that helps in making policy, objectives and resources required, allocation of resources required for the elements and assurance that specific roles are performed in an economic manner, efficiently and effectively. Cost of transacting are applied in determining policies since such policies are mainly an expenditure contract of elected officials and spending agencies that occurs in creating expenditure (Rabin, 1998). Transactional cost theory is relevant for the current research on the impact of e-banking on financial performance of listed commercial banks in Kenya in that one of the object of adoption of technology in banking is to lower the prices involved in transacting for the benefit of the customers and the banking institutions. Reduced transactional cost is expected to improve revenues of the banking institution.

2.2.2 Technology Acceptance Theory

TAT was first proposed by Davis, Bagozzi and Warshaw (1989) to examine the conceptual model of the intention of user or the degree to which information system or new technology has been done. TAT is designed on the basis of perceived usefulness and ease of use of the

new technology. Perceived usefulness of technology suggests the personal conviction to better the degree of work performed by a specific new technology or information system. Perceived ease of use of new technology implies how easy a person can learn the way to use or run a new technology or information system (Scott & Davis, 2015). The TAT model has stressed on the way perceived ease of use of new technology directly influences perceived usefulness of the technology. External variables such as environment factors surrounding an individual intervene in influencing perceived ease of use and usefulness. Hence, Technology Acceptance Theory has a basis in both crucial perceptive factors that is perceived usefulness and perceived ease of use. Technology Acceptance Theory is applied vastly on the researches involving IT. Liu and Arnett (2000) analyzed the important variables to come up with a successful website which has its basis on TAT theory.

Study by Luarn and Lin (2003) combined Technology Acceptance Theory to come up with a new integrated model that explains the behavior of consumer while interacting with technology online. Pavlou (2003) proposed an e-commerce acceptance model for online consumers by segregating and applying experimental designs and survey. Later on, Follow-up researches were carried out by (Horst, Kuttschreuter & Guttinger, 2007). The researchers deliberated on whether or not the government of Netherlands ought to provide the citizens with electronic platform to access government services like other countries do. The study adopted TAT factors including perceived risk, faith and the experiences of the public. The results of the empirical study revealed the principle of e-government based on peoples' full trust on the government firms and that citizens highly associate with IT. As a result of the empirical study, researchers found out that Technology Acceptance Theory does not merely explain how users of new technology accepts and adopts the technology but also ensures that Technology Acceptance Theory is suitable for the explaining the behavior of online user' of technology (Pavlou, 2003; Horst *et al.*, 2007).

Technology Acceptance theory is a key theory that underpins the current study on how e-banking affects the way listed banks in Kenya perform. It's not just enough for banks to come up with innovative technologies for banking. The technologies must be accepted and adopted by the clients of the bank. TAT is designed on the basis of perceived usefulness and

ease of use of the new technology. Perceived usefulness of technology implies the peoples' belief to enhance the level of work performance via a specific new technology or information system. Perceived ease of use of new technology implies how easy a person can learn how to use or operate new technology or information system (Scott & Davis, 2015). Evidence points at the importance of perceived usefulness on adoption intention. The likelihood of the adoption of e-banking is dependent on its perceived usefulness. When a technology is easy to use then it can easily be implemented in the organization.

2.2.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT was first proposed and theorised by Venkatesh *et al.*, 2003). Several researchers including Venkatesh *et al.* (2003) reviewed 8 models regarding the usage of ICT, they are; “the social cognitive theory a model , TAM and TPB ,Diffusion of Innovations (DOI), Technology Acceptance Model (TAM), the model of PC utilization, DOI, the motivational model, Theory of Reasoned Actions (TRA) and Theory of Planned Behaviour (TPB).” UTAUT was created mainly to help researchers in the field of IT/IS in the process of adoption and diffusion. In the theory, it is argued that there are 4 major: “Effort expectancy, performance expectancy, facilitating conditions and social influence.” The four constructs have positive effect on IS/IT behaviour intents and ultimately behaviour (Venkatesh *et al.*, 2003).

The UTAUT model focuses on examining the intention of the users to adopt ICT and the preceding behaviour of users. The theory gives the manager tools that can be adopted to determine the success of the introduction of new technology, prediction and explanation of the behaviour of user who accepts information technology. There are four main variables that moderate the relationship including: Age, experience, gender and voluntariness of use (Venkatesh *et al.*, 2003). Researchers have identified that UTAUT makes it possible for the manager to examine the probability of getting success out of new technology introduced in the organization and the ability of the manager to comprehend the factors that drive the process of acceptance of new technology in a bid order to design probable interventions for instance training or marketing. UTAUT focuses on technology users who may not be willing

to use new systems. A number of researchers have commented on the model citing its weaknesses while proponents of the model have embraced its propositions (Venkatesh *et al.*, 2003).

Study by Bagozzi (2007) criticised the UTAUT together with its extensions, stating that it puts across a model with forty-one explanatory variables for estimating the intentions of users technology and about eight explanatory variables for explaining behaviour of users of new technology, and that it contributed to the study of technology adoption “reaching a stage of chaos. On the contrary, Bagozzi (2007) came up with a theory that combines the various segments of information to discuss process of coming up with decisions. On the contrary, Van Raaij (2008) critiqued the UTAUT of having high explanatory power over previous Technology Acceptance Model and TAM2 due to the high coefficient of determination of level of technology adoption that is only achieved with the key moderating variables that regulates the relationships with up to four variables. The scholars also referred to the grouping and labelling of items in the constructs to be problematic due to varieties of disparate items that were joined together to establish a single psychometric construct.

UTAUT also provides a foundation for the current study. It discusses in details on how innovative technologies in banking sector is adopted and used by the employees of the bank as well as the clients of the bank. The model sought to discuss the intension of the user to adopt ICT and the succeeding behaviour of user. UTAUT offers the managers with decision-making tools that they can adopt to comprehend the introduction of new technology for prediction and elaboration of the behaviour of users in accepting IT.

2.3 Empirical Review

2.3.1 Mobile Banking and financial Performance

A study by King (2012) while conducting interview with Lori Ann LoRocco concurred with Siegel when he held that commercial banks do not comprehend the behavior of customers hence in most cases they are caught unawares by the unexpected rise in the adoption of mobile smart phones including mobile applications that has greatly dented their profits.

Additionally, the organization structure of most banks is still extremely biased in a number of cases favoring the brick and mortar as the primary channel for bank customers.

Study by Al-Jabri (2012) examined m-banking usage by examining how diffusion of innovation theory is applied. This particular research examined a set of technical qualities of electronic banking and the way they impact m-banking acceptance in non-developed countries. Koivu (2012) stated that the use of phones in Kenya has been unmanned. M-banking in Kenya impacts financial performance, character and decisions of the entire economy. The trend of continuous reliance on m-banking to the execution of money transactions is picking up the pace in a steady manner in the financial sector. M-banking is one of the innovations that have increasingly offered itself a way of cutting across several firms of economy and industry.

A research by Tchouassi (2012) examined whether mobile phones extended banking services to the unbanked using a sample drawn from countries in Sub-Saharan Africa. The research focused on establishing the way phones can be used in expanding commercial banking to those individuals from poor backgrounds, unbanked and vulnerable population. The research did note that vulnerable, poor and low-income individuals in African countries usually lack ability to access bank accounts and are often faced with a very high costs of carrying out basic transactions. Through mobile phone banks have the opportunity to provide banking services widely to those who are not banked. Additionally, economic innovation and technological, were required in order for the services to become a reality.

According to Siegel, Kagan and Lingam (2011) since customers are getting accustomed to m-banking, then it will be important for banks to follow suit. Because of that gap, Siegel thinks there is reduced revenue among commercial banks. However he says they have to face some complex challenges both internal and external most of which are internal and systemic challenges. The systemic challenges are out of the control of the individual banks. He however says that commercial banks will be important partners in development of standards, rollout of technologies and adoption of services. He also says that they will have to work with new value chain partners and endorse new revenue sharing models that properly acknowledge each players role in delivering mobile services.

Study by Chinget *al.* (2011) examined elements that affect m-banking acceptance in Malaysian firms. The research sought to employ TAM to examine the impact of m-banking adoption in Malaysia. Specifically, the study aimed at determining the association of “perceived ease of use, perceived innovativeness, perceived usefulness, perceived risks, social norms and perceived relative advantages” on the intends of adopting m-banking. The results of the study were that “perceived ease of use, perceived innovativeness, perceived usefulness, perceived risks and perceived relative advantages” were the elements impacting on the intent behavior of mobile customers to embrace m-banking services in Malaysia. However, the social standards were established not to be a significant element in this the research. Study by Kingoo (2011) examined the association of e-banking and how commercial banks in Kenya performed financially. The study’s attention was on MFIs in Nairobi. The research examined the vast e-banking system.

Mbiti and Weil (2011) in their research about the impacts of MPESA in Kenya cited Gikuju (2009) as a practitioner who researched about the impact of mobile banking under which his emphasis was on MPESA and its effect on the financial statements of postal corporation Kenya. According to Mbiti and Weil, Gikuju found out that the profits and revenue of Postal Corporation Kenya reduced rapidly after the introduction of MPESA. He continues to say that western Union and money gram continued to cut prices though they could not meet MPESA’s superior convenience.

A Study by McCown and Zimmerman (2010) established that m-banking in countries that are developing was full of skepticism among financiers and insiders in the financial sector while the proponents of mobile banking argued that mobile phones could be used to transform personal finance in poor countries. The financial regulators gave a warning of possible money laundering and majority banks were concerned that lower clients balance would be unworthy of the charge on transactions. It was recommended that m-banking provide support in delivering its services to the economy. Kigen (2010) did a study on the effect of m-banking on the charges of transacting of microfinance banking sectors. The study established that m-banking had low charges of transacting greatly although they weren’t positively felt by 22 commercial banks since they had small mobile banking customer base.

The study examined the effect of mobile banking on microfinance institutions transactional costs.

Research by Malhotra and Singh (2009) studied the effects of online banking on how commercial banks performed and risk established that on average online banks are bigger, more operationally efficient and profitable. It also established that online banks have high quality asset and are managed better to minimize the expenditure and that online banks operating in India depend more on customer deposits. It further established that small banks that embrace online banking experience negative effects on profits.

A study by Wambari (2009) examined mobile banking in countries that are developing; the study focused on Kenya. The focus of the study was to investigate the benefits of m-banking in the daily operation of small businesses in Kenya and to establish the obstacles faced in the use of m-banking as a tool of business and to have appreciation on the merits and demerits thereof. The research elaborated on adopting and usage of mobile phones as product of a social process that is linked to social practices of SMEs that leads to some economic benefits. Research by Munaye (2009) examined how m-banking is applied by equity bank as a strategic response tool to environmental challenges. The study did not examine the effects of m-banking on how the bank performed financially.

The term Mobile banking is used to refer for a platform that allows banks customers to perform banking transactions through mobile device (Anyasi & Otubu, 2009). Mobile banking service is provided by commercial banking institutions in tandem with mobile phone operators. Donner and Tellez (2008) however did not examine m-banking and development of the economy where they intended to relate adoption, use and impact. The research results revealed that via offering avenues for reducing the price of transferring cash from one to another physical place and providing an avenue to link up other customers within the formal financial systems. M-banking systems have proved crucial for innovation benefiting the countries that are developing. Nevertheless, the real measure of the value of mobile banking platform required many researches using multiple research methodologies involving multiple theoretical perspectives prior to giving answers to questions on acceptance and effect.

Tiwari, Buse and Herstatt (2006) examined m-banking as a business strategy, and how the m-banking technology affects clients' behavior as well as its implications for commercial banking institutions. The research analyze the available opportunities for commercial banks to produce enough earnings by giving value added innovative m-banking financial offers while at the same time retaining and extending their technology base to understanding customers. A study by Shirley and Sushanta (2006) on the effects of IT on the banking sector while analyzing both empirically and theoretically, how IT associated commercial banking spending can influence the profits of the bank through competition in offering financial services. The study used a panel of sixty United States commercial banks covering 20-year period to forecast the effects of IT on the level of profitability of commercial banks. The researchers established that by adopting Information Technology, they could lead to saving of cost. Additionally, higher IT expenditure in creating network affects its performance by lowering bank profits.

Tiwari, Buse and Herstatt (2006) defined m-banking as any kind of transaction that involves the change of ownership or rights to the usage goods and service. Mobile banking is usually started and ended by adopting access to mobile via computer networks with the aid of electronic device. The terms M-payments, M-finance, M-banking, M-transfer describes a number of applications that enable users of new technology to utilize their mobile telephones to store value in an account linked to their handsets, manipulate their bank accounts and transfer funds from their accounts to other users or even access credit and insurance products online. Mobile banking has therefore improved access to financial services in the most developed and developing countries. The initial targeted population was initially clients in the most developed countries. Mobile banking enables banks to offer complementing services such as ATMs, cheque books, point of sale networks and internet resources, smart cash, Voice mail/landline interfaces and other techniques of money management with no cash handling (Karjaluoto, 2002). The M-Pesa platform has put pressure on money transfer firms to reduce their prices. M-Pesa has also forced these money transfer institutions and other financial institutions to better their offerings and service in the market. In most cases, the financial firms have entered into partnership with M-Pesa to give to their clients an integrated band of service (Njiraini & Anyanzwa, 2008).

2.3.2 Agency Banking and Financial Performance

According to research by Salome Mwangeli (2013), Agency banking has been able provide commercial banking customers with access to banking services within the comfort of their own neighbourhood. Agency banking has made it possible to dramatically lower the price of offering services dealing with finance to the unbanked and unreached individuals. Agency banking has aided in dealing with the 2 main challenges of accessing to finances and the cost of roll-out and the cost of the banks dealing with low value transactions that is not profitable. This lowering of cost of transactions is achieved through leveraging on the existing networks of 3rd party independent businesses for money transactions and account opening and by conducting all transactions on line.

Study by Aduda and Kingoo (2013) on the association of agency banking and how commercial banks in Kenya performed financially established that of the forty-three commercial banks in Kenya banks, eight had already rolled out the agency banking service .The results further established that annual performance rose positively and significantly between 2008 to 2011. It concludes that agency banking has progressively improved how commercial banks that have adopted the agency banking services because of to its convenience and efficiency in operation performed financially. Furthermore, the research concluded that accessibility of services related to finances by clients via agency banking had a direct positive impact on how commercial banks and the SMEs in Kenya performed financially (Aduda *et al.*, 2013).

According to study by Alexander and Hall (2013), Agency banking is has been expected to take a leading role in improving financial performance of Small and Medium Enterprises. Agency banking is as an ultimate finding of bettered finance accessibility to business firms and results to improved financial performance of SMEs because of lowered transacting prices and liquidity advantage. Inadequate access to finances freezes firm's size, and also its development rate, profits levels, activations and their operational scope. A good Understanding of the effects of being excluded financially on the performance of businesses is very crucial to how the economy performs a whole specifically in the developing

economy. Additionally, imperfections of capital market can erode the capital stock accumulation, the rate of ROI, innovations and accumulation (Alexander & Hall, 2013).

Study by Veniard and Melinda (2010) examined the way agency banking alters with those individuals holding small accounts; the study used data from service providers in Latin America, Africa and Asia. The study established that agency banking systems are triple time cheaper to operate compared to physical branches of the commercial banks. They study further showed that despite the fact that agents banking acquire high variable cost obtained from commissions, the fixed charge for any transacting done is still high. The study concluded agency transactions platforms may also be beneficial from extra income related with transactions performed by agent.

Literature has defined agency banking as a form of branchless banking involving contracting services of postal and retail outlet by commercial banks to deal with processing of its clients transactions (Morawczynski & Mark, 2009). Agency banking differs from a branch teller in that those operators of retail outlets receive benefits from the government or receive deposits direct from employers. The institutions that work as banking agents include supermarkets, pharmacies, lottery outlets, convenience stores and post offices (Consultative Group to Assist the Poor, 2006). Agency banking is observed to be a kind of partnership between a banking institution and a non-banking institutions ranging from lottery kiosks, post offices, pharmacies, etc. in providing outlets to offer financial services (Kumar, Nair, Parsons & Urdapilleta, 2006).

Agency banking financial model is supposed to better accessibility of financial services by permitting SMEs to operate satellite branches for the benefits of banks. As shown by early experiences, the agency banking has largely contributed to financial inclusiveness in those countries that are developing like Kenya (Mwando, 2013). This has led to penetration of agency banking in the developing countries as evidenced by penetration of agency banking in countries such as in Australia, France, Brazil, Nigeria, South Africa and the Philippines (Siedek, 2008). In the contemporary financial sector, regulators and Policy makers are

showing keen interest in agency banking topic, even though in most countries the regulation have continued to constrict the emergence of agency banking (Morawczynski & Mark, 2009).

According to study Lyman, Pickens, and Porteous, (2008), Agency banking has essentially lowered the cost of delivery of financial services to the unbanked and unreached people. The reduction in cost creates an opportunity to seriously improve the size of the population that is accessible to formal banking and finance especially in the remote parts of the country where most of the population of the developing countries reside and live. According to study by Ivantury (2006), agency banking has the potential of benefiting the users of the service by minimizing transaction cost, short queues than in branches, longer opening hours, highly accessible for the benefit of illiterates and the low-income earners. Agency has improved reputation from affiliation with well-known financial institutions, sales from additional foot-traffic, and market share by banks, increased covered area with low-prices solutions in regions with minimal transactions, differentiation from other businesses, additional revenue from commissions and incentives (Ivantury, 2006).

Research by Lyman *et al.* (2006) showed that that clients funds protection is priority for many financial regulators and financial institutions under agency banking as loss of money transacted over the platform could be disadvantageous to the clients and also the trust of the public in financial systems. Hence, agency banking deserves to be regulated and commercial banking institutions ought to comply with regulations created by regulators to help in ensuring systematic stability as well as depositor protection. Countries with higher adoption of branchless banking models have adopted a variety of approaches in handling and protecting the funds of their client. Even though agency banking is a bank-based model, it has a different regulatory treatment from the normal branch banking (Collins, 2010). Research by Ivantury and Timothy (2006) showed that that agency banking could be beneficial to the clients in a number of ways including lowering of transaction cost, short queues, longer opening hours, highly accessible for illiterates and the poor.

2.3.3 Online Banking and financial performance

A paper by Okiro and Ndungu (2013) studied the effect of e-banking on how financial organizations in Kenya perform financially. The target population consisted of 61 financial institutions. From the findings it was revealed that the greatest users of e-banking were commercial banks followed by DT-SACCOs whereas not even a single MFI adopted its use. The study further showed that internet banking faced different obstacles including system delays, high costs of transacting and limited amounts transferrable and fraud.

According to research by Chung and Dutta (2012) online banking has become common among the commercial. They study explained that banks have established that internet banking has high potential and therefore it has become necessary for them to incorporate it in their business. The researchers also showed that online banking has given unthought-of off speed in banking system and hence have played an important role in the banking system globalization. As online banking makes inroads in the commercial banks, the market participants have also begun using online banking for trading in securities. Via the adoption of online banking, there has been an upsurge in trading volumes, trading frequency and turnover ratio. The researcher therefore finds out that institutional innovation and how commercial banks perform financially are positively related.

A paper by Malhotra and Singh (2009) analysed the influence of e-banking on how commercial banks in India perform financially. The study examined 85 commercial banks in India over the periods between 1998 and 2006 nearly represented thirty nine percent of all scheduled commercial banks in India. The findings revealed that about 57% of the commercial banks in India are provided transactional via online platform to their clients. The simple regression analysis showed that online banks were big banks whose operations are efficient and more profitable in comparison to banks that are non-Internet. The level of dependency on deposits is much higher for internet based banks compared to non-internet banks; the findings of the study established that profits and internet banking are not statistically and significantly related while e-banking and risk profits were negatively and statistically significant.

Njuguna *et al.* (2009) did a study on the factors that affect embracing of e-banking among those clients who own commercial bank accounts in Nairobi County; Kenya. From the findings of the study it was established that only 24.82% embraced e-banking despite the high rates of internet usage. From the findings, it was concluded that e-banking is still in its inception stages because of the small percentage of its users. It was further established that “perceived ease of use, perceived usefulness, relative advantage, self-efficacy, compatibility and result demonstrability” are significantly related with the intents of using e-banking. On the other hand, “visibility, risk and trial ability” were insignificant.

Ram, Kagan and Lingam (2008) analysed the effects online banking pose on the way community banks performed financially while employing correlation study design. The association between on-line banking and how commercial banks perform financially was examined by regressing profit efficiency index against online banking intensity measures. The study showed that the increased usage of internet in banking was an additional channel of the bank marketing its services and products and that it had significantly improved the community banks performance financially. It also showed that product innovation improves how commercial banks perform financially.

Research by Onay (2008) examined the impacts of online banking on profitability of commercial in Turkey. The study analysed thirteen commercial banks that had already embraced internet banking in Turkey between 1996 and 2005. The study employed the use of macroeconomic control variables, to investigate the effect of e-banking on how commercial banks performed financially; the study determined performance using “interest spread, return on assets (ROA), return on equity (ROE), overhead expenses and on commission and fee income controlling.” The research used lagged values for the measurement of online banking adoption to show the changes in the impact over time. The findings showed that online banking begins contributing to ROE of banks with a two year time lag confirming the

findings of wearers a negative effect of online banking is observed for a single year. The results further provided proof that investing in e-banking is a gradual procedure.

A paper by Hernando and Nieto (2006) studied the effect of internet change on how banks perform financially. The study established that using internet as a way of delivering services is cheap and therefore results to increase in profits. The research further showed that internet is employed as a complement to the brick and mortar branches. This impact is not instantaneous hence being statistically significant in the 18th month after the adoption of internet banking and reaching a maximum after approximately two and a half years of the adoption of internet banking. It was further established that multichannel banks benefited from the use of e-banking since it reduced their expenditure and it was efficient.

Study by DeYoung (2005) examined the performance of banks that had adopted internet banking versus the non-internet banks in United States market. From the findings it was established that several banks experienced issues when starting up; it was further established that less evidence existed to support the claim that learning technology helps to improve how internet only based banks perform financially. The study further establishes that the profits of the bank are low internet-only based banks compared to non-internet based banks in the United States market. Later on, DeYoung, Lang and Nolle (2007) investigated impacts of e-banking on how community bank in US performed. The study compared the online banks to brick and mortar banks performance over a three-year period. The study noted that e-banking betters the profits of banks via increased income streams from deposit service charges.

2.3.4 ATM Banking And Financial Performance

Another facet of electronic banking is ATM. ATM is a form of computerized telecommunications tool that makes it possible for commercial banking customers to access financial transactions in a public space without the use of a human clerk or a cashier or bank teller. A paper by Ogbuji *et al.* (2012) noted that ATM is one of the few existing replacements for the labor intensive transaction system that is usually affected via the paper-based payment instruments. An ATM enables commercial bank clients to carry out bank transactions from any other ATM machine all over the world. The adoption of ATM

essentially performs the traditional tasks of the cashiers in a commercial bank and other bank counter staff. The ATM is electronically operated therefore any request by bank client is made at an instant electronically. The combined effect of human tellers and ATM imply that the bank will have more productivity during banking hours. Additionally, the bank saves clients time in delivery of services as it is an alternative to queuing in banking halls. The bank clients can therefore spend the time saved on other productive things. Furthermore, as the ATMs continue to provide services when human tellers halt provision of services, there is continuous service provision leading to sustained productivity of the banks.

A study by Mahdi and Mehrdad (2010) concludes that ATMs banking will causes a reduction in cash circulation, the improvement in how efficient banking institutions are, a decrease in client banking transactional costs, bank costs decrease. Study further explains that if ATMs are generally available over geographically dispersed areas, the benefit of adopting ATMs will essentially improve since bank customers would be in a position to access their money in the bank accounts from any geographically dispersed location they want further away from their bank branches (Milne, 2006).

This means that ATM network value increase with the increase in available ATM locations and the value of a network of a bank to a client will be explained partly by the final network size of the bank. The study further finds via the usage of ATMs, bank customers can access the money in their bank accounts by making credit card cash advances, cash withdrawals and viewing their balance and also buying phone credit. The access to ATMs therefore improves convenience to customers since customers can withdrawal their money in their bank accounts from their point of reach without having to visit the bank. The adoption of ATMs increases the efficiency of commercial banks and mitigates the costs of transactions thereby leading to financial performance. The results of the study is in congruence with report by Fannie Mae Foundation of that showed that ATMs serve approximately 420 million transactions every year for a total of \$3.3 billion in gross yearly income.

2.3.5 Effect of Electronic Banking on Financial Performance

Siam (2006) stated that, the use of internet acts as a weapon for the bank, since they can use it as a mode of distribution, offering quality products at cheaper costs and to a large number of clients without limits; the products being similar as to the ones offered in the branch offices. Through the use of internet, banks are able to offer value added services at lowered costs, and also they are bale to benefit from selling credit cards and loans. Clients also benefit from online services offered by the bank since they are time saving and cheap. Additionally, online banking provides banks with information regarding the habits of its customers and what they prefer; this information is important since they can use it to market and improve their services. The bank greatly benefit by expanding its customer base and costs of transactions (Siam, 2006). According to Malhotra and Singh (2004), banking using the internet is a strategy that can be used to achieve high efficiency, controlled operations and lowers the cost by discarding the use of old ways of using paper and labour intensive techniques and replacing them with automated procedures resulting to high levels of production and profitability.

Meuter (2010), classified Internet banking adoption into two categories which includes access technology and infrastructure related factors and sector specific retail banking factors. The first class include internet penetration rates, skill of consumers in using internet and related technologies, attitude towards technology, security and privacy concerns. The second class involves trust in banking institution, banking culture, e-banking culture and Internet banking push. The study by Iacono and Orlikowski (2014) found that trust significantly affects attitude towards e-banking acceptance. To encourage e-banking adoption, banks need to develop strategies that improve the customer's trust in the underlying technology. The other factors include quick response, assurance, follow-up and empathy. Security, correct transaction, customer control on transaction (personalization), order tracking facilities and privacy are other important factors in the online service that affect the customer satisfaction. Akerlof and Girardone (2011), show that E- banking results in cost and efficiency gains for banks yet very few banks are using it.

Vila (2013) provides evidence respectively for cost reduction and productivity gains as a result of technological change for European Union banks. Carlson and Lang (2011) showed that E-banking lowers operational costs while increasing customer satisfaction and retention in the Turkish retail banking sector. Meuter (2010) suggests that e-banking is driven largely by the prospects of operating costs minimization and operating revenues maximization. According to Ombati (2011), Technology (IT) offers banks the potential to dramatically reduce operating costs and improves the quality of management information hence making banking more profitable.

2.4 Critique of Literature and Research Gap

Al-Jabri (2012) examined m-banking usage by examining how diffusion of innovation theory is applied. This study focused on m-banking only which is a form of e-banking. Tchouassi (2012) examined whether mobile phones extended banking services to the unbanked using a sample drawn from countries in Sub-Saharan Africa. This study focused on one form of e-banking that is mobile banking. Ching *et al.* (2011) examined elements that affect m-banking acceptance in Malaysian firms. The study was conducted in Malaysia; the findings cannot be generalized to Kenya since the banking regulations may differ. Malhotra and Singh (2009) studied the effects of online banking on how commercial banks performed and risk established that on average online banks are bigger, more operationally efficient and profitable. The study focused on only one form of e-banking that is online banking, the current study will focus on the various types of e-banking and how they are related. Veniard and Melinda (2010) examined the way agency banking alters with those individuals holding small accounts; the study used data from service providers in Latin America, Africa and Asia. The study focused on only one form of e-banking that is agency banking. Malhotra and Singh (2009) analysed the influence of e-banking on how commercial banks in India perform financially. The study was conducted in India; the findings cannot be generalized to Kenya since the banking regulations may differ.

Njuguna *et al.* (2009) did a study on the factors that affect embracion of e-banking among those clients who own commercial bank accounts in Nairobi County; Kenya. The study focused on what influences clients to use e-banking. The current study will focus on the

relationship between e-banking and financial performance of banks. Onay (2008) examined the impacts of online banking on profitability of commercial in Turkey. DeYoung (2005) examined the performance of banks that had adopted internet banking versus the non-internet banks in United States market. The studies were conducted in Turkey and US; the findings cannot be generalized to Kenya since the banking regulations may differ

From the empirical literature it is evident that there limited literature on electronic banking in Kenya. Most of the literature is from global from developed nations like US. Further, most of the studies focus on mobile banking. Mobile banking is just a form of electronic banking; therefore electronic banking incorporates numerous types of banking. To fill the gap the study was conducted in a developing country that is Kenya. The study sought to examine the effect of electronic banking on financial performance of listed commercial banks in Kenya.

2.5 Conceptual Framework

The conceptual framework shows the interplay of the primary variables of the study. The conceptual framework exemplifies the association of dependent and explanatory variable of the study. In this particular study, the independent variable was electronic banking (m-banking, card banking, agency banking, ATM banking and online banking), the dependent variable was the financial performance of listed commercial banks in Kenya.

Table 2.1: Operationalization of Variables

Variable	Notation	Measurement	Possible sign
Dependent variable			
Financial performance	Y	Return on Assets = net income divided by total assets	
Independent variables			
Mobile banking	X ₁	The log of money transacted	+
Agency banking	X ₂	The log of money transacted	+
ATM Banking	X ₃	The log of money transacted	+
Online banking	X ₄	The log of money transacted	+

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter presents the research design, the target population, the sample frame, sample and sample procedure, data collection instruments, data collection procedure, data processing and analysis and presentation methods.

3.2 Research design

This research used quantitative descriptive research design while employing panel data analysis technique. Quantitative designs stresses on the objective measurements and the statistical or mathematical data analysis collected via research instruments including polls, questionnaires, and surveys and the statistical manipulation of existing quantitative data using a specified computational technique (Kothari, 2004). The study examined the effect of e-banking on financial performance of listed commercial banks in Kenya. Panel data analysis was employed. The study had both cross sectional and longitudinal aspects since the study covered five years and covering 11 listed commercial banks in Kenya.

3.3 Target Population

According to Kothari (2006), population of a research is the entire set of individuals or items that are explained in the research as being the study's area and which the researcher having an observation of their behaviours. The population of a study consisted of the entire items that fit the area of study. The targeted population for the current study involved all the eleven listed commercial banks in Kenya that operated between 2013 and 2017. According to Nairobi Security Exchange website, the body charged with the registration of public limited companies to allow them offer shares to the public in Kenya, Kenya has some 11 listed commercial banks shown in appendix iv. The current study was a survey of all the eleven listed commercial banks in Kenya meaning that all the 11 listed commercial banks in Kenya were subject of the study. The sample size of the current study was therefore the 11 listed commercial banks in Kenya. Therefore no sampling was required.

3.4 Data Collection Instruments

The study relied entirely on secondary data hence data collection sheets was used for recording information extracted from the annual banking supervisory reports of CBK and audited financial reports of the listed commercial banks in Kenya for the study period. The extracted data was recorded on data collection sheets in appendix (I).

3.5 Data Collection Procedure

As determined by the nature of financial studies, the study employed secondary data sources in the current study. Secondary data was sourced from statistics maintained by the CBK that is the regulatory body which supervises the banking sector in Kenya. Key financial data that was extracted from annual banking supervisory reports published by CBK and Audited financial statements of individual listed commercial in Kenya. The extracted data was recorded on data collection sheets shown in appendix (I).

3.6 Data Analysis

The data to be gathered from the report was examined for completeness and accuracy before start of the analysis. Data was entered in Excel 2016 and then exported to STATA software version 14. The panel data was analysed with the aid of STATA. The panel data was analysed by use of descriptive statistics, correlation analysis, and multiple regression analysis. Descriptive statistics were used to summarize and explain the study variables as observed in the banks. Descriptive statistics added measures of central tendencies and dispersion. Inferential statistics included bivariate Pearson correlation, multiple regressions, ANOVA and coefficient of determination. This analysis enabled testing the effect of e-banking on financial performance of listed commercial banks in Kenya. The representations of the results were in well explained tables.

3.6.1 Empirical Model

The empirical model used in this study is as shown in the regression equation (1). To ensure the Classical linear regression model was robust, the model assumptions tested in this study included; Linearity; Normality; Homoscedasticity; Multicollinearity and Auto-correlation just as in study by (Ongore & Kusa, 2013).

$$Y_{ij} = \beta_0 + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \beta_3 X_{3ij} + \beta_4 X_{4ij} + \beta_5 X_{5ij} + \epsilon_i \dots \dots \dots$$

Equation (1)

Where Y= Performance of listed commercial banks

X₁: Mobile banking

X₂: agency banking

X₃: ATM banking

X₄: Online banking

β₀ =intercept term

β₁, β₂, β₃ and β₄ = were the coefficients of the independent variables respectively

i = 1, 2,....., 11: Number of banks

j = 2013,2014,2015,2016 and 2017

3.6.2 Model Specification Test

Test for Normality

Statistically, normality tests are performed to establish whether the data set is modelled in a good way by a normal distribution and to determine the likelihood that it's for a random variable underlying the data set to be normal distribution. To test for normality, Shapiro-Wilk test was adopted by the current study. To test for linearity data set from each variable of the study, the researcher used measure of goodness of fit. If all the data points fall on the same straight line, then the set of data is said to be linear. Coefficient of determination that is almost zero suggests a poor fit of OLS line and hence low or no linearity.

Test for Multicollinearity

In financial econometrics, multicollinearity is a phenomenon whereby two or more independent variables in a multiple regression model have a highly correlation with each other. In such an instance, the estimated coefficient of the independent variables fitted in the multiple regression models can transform erratically due to a small changes in the model or the data (Goldberger, 1991). The study employed Variance Inflation Factor (VIF) to check for multicollinearity where a VIF of 5 or 10 and above shows presence of multicollinearity problem (Verbeek & Marno, 2012)

In financial econometrics, a sequence of random variables is homoscedastic if all random variables in the sequence have the same finite variance; also referred to as homogeneity of variance. The complementary problematic notion is referred to as heteroscedasticity. Heteroscedasticity may lead to overestimating the goodness of fit as measured by the Pearson correlation (McCulloch, 1985). The current study adopted Breusch-pagan test for presence of Heteroscedasticity by ensuring that the residuals of the model are not auto correlated but independent.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND FINDINGS

4.1 Introduction

This section of the study presents the analyses data and findings based on the research objectives. The main objective of the study was to establish the effect of e-banking on how listed commercial banks in Kenya performed financially. Secondary data was collected from 11 commercial banks listed in the NSE over a 5-year period from year 2013 to 2017 and analyzed using STATA and presented in frequency tables. Descriptive and inferential statistics have been used to discuss the findings of the study.

4.2 Descriptive Statistics

In section 4.2 the study presented the research finding on the descriptive statistic in the data collected.

Table 4.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Performance	55	7272495	5235016	55298	1.98e+07
ATM	55	81.6	75.08479	8	236
Mobile	55	83623.62	72976.57	19462	328448
Agency	55	97.41818	117.8365	1	412
Online	55	1633.749	1245.726	651.81	9985.6

From the findings, the study found that there was mean of Ksh 7,272,495 Million on performance of commercial banks listed in the NSE, there was a mean of 81.6 ATM banking among commercial banks listed in the NSE. The mean of mobile banking was found to be 83623.62, the mean for agency banking was found to be 97.41818, and finally the mean for online banking was found to be 1633.749.

4.2.1 Normality test

Table 4.2: Normality Test

Variable	Obs	W	V	z	Prob>z
Performance	55	0.92929	3.586	2.739	0.00308
ATM	55	0.78313	10.998	5.142	0.00000
Mobile	55	0.77992	11.161	5.174	0.00000
Agency	55	0.75928	12.207	5.366	0.00000
Online	55	0.45238	27.771	7.129	0.00000

Multiple regression analysis assumes that variables have normal distributions. Variable that are not normally distributed can affect their association and significance tests. This study used Shapiro Wilk Test to test for normality of the data. Shapiro Wilk Test assumes that the population is normally distributed; this is the null-hypothesis. Therefore is the selected alpha level is greater than the p-value, then, we reject the null hypothesis since it will be evident that the population does not belong to a normally distributed population. On the other hand, if selected alpha is less than the p-value then we accept the null hypothesis that the data was obtained from a normally distributed population. From the finding's financial performance (p-value=0.00308), ATM banking (p-value=0.000), agency banking (p-value=0.000), online banking (p-value=0.000) and mobile banking (p-value=0.000) was normally distributed. This shows that all the variable was normally distributed and hence the data meets the regression analysis assumption of normality of data.

4.2.2 Correlation Analysis

Table 4. 3: Correlation Analysis

	Performance	ATM	Mobile	Agency	Online
Performance	1.0000				
ATM	0.7217 0.0000	1.0000			
Mobile	0.6902 0.0000	0.8781 0.0000	1.0000		
Agency	0.6696 0.0000	0.9808 0.0000	0.9025 0.0000	1.0000	
Online	0.0233 0.8659	0.0375 0.7858	0.1004 0.4660	0.0408 0.7676	1.0000

The study carried out spearman correlation analysis. From the findings, it was established that financial performance of individual commercial banks and various variables, were strongly and positively correlated ATM banking and financial performance as shown by correlation factor of 0.7217. Financial performance of commercial banks and mobile banking were found to be positively correlated as shown by correlation coefficient of 0.6902. The study also established that financial performance of individual commercial bank and agency banking were strongly and positively correlated as shown by correlation coefficient of 0.6696. Finally, it was established that there was a weak positive correlation between financial performance of individual commercial bank and online banking as shown by correlation coefficient of 0.0233.

4.3 Model Specification Test

4.3.1 Autocorrelation Test

Durbin-Watson d test was used to check for autocorrelation where the value of d lies between 0 and 4. If the value is 2 then we will conclude that no autocorrelation, when its 4 or close to 4 then there is negative autocorrelation while it's close to 1 and 0 then the is positive autocorrelation. Breusch-Godfrey Langrage Multiplier test was also used to test for autocorrelation.

Table 4.4: Breusch-Godfrey Langrage Multiplier test

Breusch-Godfrey LM test for autocorrelation

lags (p)	chi2	df	Prob > chi2
1	1.937	1	0.1640

H0: no serial correlation

From the findings, the p-value (0.1640), which is less than the significance level (0.05), and hence we accept the null hypothesis that there is no serial correlation among the variables.

4.3.2 Heteroscedasticity Test

The study used Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. Homoscedasticity explain the situation whereby all the error terms of the predictor variables are similar while heteroscedasticity which is the opposite of homoscedasticity refers to the situation whereby the error terms of the predictor variables differ. The effect of overlooking the assumption of homoscedasticity id the increase of degree as the heteroscedasticity increases.

Table 4.5: Breusch-Pagan/Cook-Weisberg test for heteroscedasticity

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of FDI

chi2(1)      =    16.82
Prob > chi2   =    0.0000
```

From the finding it was revealed that the p- value of 0.000 was less than 0.05 significant levels implying that the study rejects the null hypothesis of homoscedasticity.

4.3.3 Test for Multicollinearity

Table 4.6: Test for Multicollinearity

```
. vif
```

Variable	VIF	1/VIF
X2	2.38	0.420323
X3	2.32	0.431817
X4	1.13	0.884733
X1	1.06	0.939568
Mean VIF	1.72	

If the independent variables are perfectly related linearly, then the estimation of regression model cannot be uniquely calculated. Collinearity refers to the situation whereby two variables are almost attaining perfect linear combination with each other. When the variables involved are more than two then it is referred to as multicollinearity, although the two terms are often used interchangeably. If the value of R Squared is high but none of the independent variables are significant or very few independent variables are significant, we can suspect that probably, a model is suffering from multicollinearity. If the value of VIF is more than 10 or tolerance is more than 0.2, we can say that the model is suffering from multicollinearity. Tolerance level formula is calculated as 1 divided by VIF while the t statistic formula is

calculated as coefficient divided by standard error. t statistic and p values have opposite values all the time.

Multicollinearity was tested for the data used in the research. This was done using the variance inflation factor (VIF) which quantifies how much the variance is inflated. The findings indicate that the VIF values were close to 1 (1.72) indicating that the variance of the variables was inflated at a very low level. The analysis exhibits signs of multicollinearity though low levels. The results indicate that the overall VIF is 1.72 which is less than 10 implying that the study data did not exhibit multicollinearity problem as recommended by (Field, 2009). Thus, all the variables based on the VIF indicators have no severe multicollinearity problem. After removing the problem of multicollinearity from a regression model, some of the variables can become significant. Ways of removing multicollinearity include increasing sample size and transformation of Variables.

4.3.4 Testing for Fixed or Random Effects

Table 4.7: Testing for Fixed or Random Effects

```
. hausman fixed random
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
ATM	125520.9	36236.82	89284.07	9003.349
Mobile	38.91936	2.560293	36.35906	12.1219
Agency	-70382.46	7135.047	-77517.51	7671.008
Online	-143.1731	37.33041	-180.5035	318.9883

b = consistent under Ho and Ha; obtained from regress
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(4) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$$

$$= 103.24$$

Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

To decide between fixed or random effects a Hausman test was conducted where the null hypothesis was that the preferred model is random effects, that is if the Prob>chi2 value was

greater than 0.05. The alternative the fixed effects if the Prob>chi2 value was less than 0.05. It basically tested whether the unique errors (ui) are correlated with the regressors. Since the Prob>chi2 value (0.0000) was less than 0.05 a fixed effect was preferred and conducted.

4.4 Panel Regression Analysis

4.4.1 Hypothesis One

H₀₁: Mobile banking has no significant effect on financial performance of listed commercial banks in Kenya

Table 4. 8: Performance and Mobile Banking

```
. regress Performance Mobile
```

Source	SS	df	MS	Number of obs =	55
Model	7.0504e+14	1	7.0504e+14	F(1, 53) =	48.22
Residual	7.7485e+14	53	1.4620e+13	Prob > F	= 0.0000
Total	1.4799e+15	54	2.7405e+13	R-squared	= 0.4764
				Adj R-squared	= 0.4665
				Root MSE	= 3.8e+06

Performance	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Mobile	49.5138	7.130028	6.94	0.000	35.21277 63.81482
_cons	3131972	788236.1	3.97	0.000	1550971 4712973

From the ANOVA statistics it is evident that-banking and financial performance of the bank are significantly associated s shown by a significance value of 0.000. Also, mobile banking and financial performance of the bank were significantly associated since the F critical value was found to be less than F calculated (2.434<48.22). since the p value was less than 0.05 it indicates that financial performance of individual banks are significantly influenced by mobile banking significantly (Critical value = 2.434). From the findings it was seen that R² was 0.4822, which is an indication that at 95% confidence interval, there was 52% variation in the way commercial banks performed due to changes in mobile banking. This shows that changes in m-banking could account for 48.22% in variation of the way commercial banks perform. Therefore it was concluded on the null hypothesis that m-banking does not significantly affect performance of listed commercial banks in Kenya.

From the finding of the study the established equation was between financial performance and mobile banking was;

$$Y = 33131972 + 49.5138 X_1$$

The regression equation established that by holding m-banking constant it leads to change in the performance of commercial banks by 33131972. By increasing m-banking by a single unit it leads to the increase of financial performance of commercial banks by 49.5138 units.

4.4.2 Hypothesis Two

H₀2: Agency banking has no significant effect on financial performance of listed commercial banks in Kenya

Table 4. 9: Performance and Agency Banking

```
. regress Performance Agency
```

Source	SS	df	MS			
Model	6.6362e+14	1	6.6362e+14	Number of obs =	55	
Residual	8.1627e+14	53	1.5401e+13	F(1, 53) =	43.09	
Total	1.4799e+15	54	2.7405e+13	Prob > F =	0.0000	
				R-squared =	0.4484	
				Adj R-squared =	0.4380	
				Root MSE =	3.9e+06	

Performance	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Agency	29749.79	4532.128	6.56	0.000	20659.49	38840.08
_cons	4374325	689170.6	6.35	0.000	2992024	5756626

ANOVA statistics revealed that the regression model had a significance level of 0.000, indicating significant association between agency banking and financial performance of the bank. F critical value was found to be less than F calculated (2.434<43.09), this is an indication that agency banking and financial performance of commercial banks listed in the NSE are significantly associated. The p value which was less than 0.05 an indication that agency banking significantly influences financial performance of individual banks (Critical value = 2.434). R² was 0.4484, which indicates that at 95% confidence interval changes in agency banking leads to 52% variation on how commercial banks perform. This means that changes in agency banking can only explain 44.84% variation in financial performance of

commercial banks. Therefore the null hypothesis is rejected that agency banking does not significantly affect financial performance of listed commercial banks in Kenya

From the finding of the study the established equation was between financial performance and Agency banking was;

$$Y = 4374325 + 29749.79 X_1$$

As shown in the regression equation, financial performance of commercial banks would be at 4374325 if agency banking is held to a constant of zero. Increasing agency banking by a single unit will lead to increase in how commercial banks perform by 29749.79 units. Agency banking financial model is supposed to better accessibility of financial services by permitting SMEs to operate satellite branches for the benefits of banks. As shown by early experiences, the agency banking has largely contributed to financial inclusiveness in developing countries like Kenya.

4.4.3 Hypothesis Three

H₀₃: ATM banking has no significant effect on financial performance of listed commercial banks in Kenya

Table 4. 10: Performance and ATM banking

```
. regress Performance ATM
```

Source	SS	df	MS			
Model	7.7077e+14	1	7.7077e+14	Number of obs =	55	
Residual	7.0912e+14	53	1.3380e+13	F(1, 53) =	57.61	
Total	1.4799e+15	54	2.7405e+13	Prob > F	= 0.0000	
				R-squared	= 0.5208	
				Adj R-squared	= 0.5118	
				Root MSE	= 3.7e+06	

Performance	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ATM	50316.87	6629.386	7.59	0.000	37020.01	63613.74
_cons	3166638	732053	4.33	0.000	1698326	4634951

From the findings of ANOVA statistics ATM banking and financial performance of the bank are significantly associated since their level of significance is 0.000. F critical value was found to be less than F calculated (2.434<57.61), this is an indication that ATM banking and financial performance of commercial banks listed in the NSE were significantly associated.

The p value which was less than 0.05 an indication that ATM banking significantly influence financial performance of individual banks (Critical value = 2.434). The value of R square was 0.5208, this is an indication that at 95% confidence interval, changes in ATM banking leads to variation of 52% on how commercial banks perform financially. This shows that only 52% of the changes on financial performance of commercial banks could be accounted for by changes in ATM banking. This led to rejection of the null hypothesis that ATM banking has no significant effect on financial performance of listed commercial banks in Kenya

From the finding of the study the established equation was between financial performance and ATM banking was;

$$Y = 3166638 + 50316.87 X_1$$

The regression equation shows that financial performance of commercial banks will be at 3166638 if ATM banking is held to a constant zero. Increasing ATM banking by a single unit will lead to change in how commercial bans perform financially by 50316.87 units.

4.4.4 Hypothesis Four

H₀₄: Online banking has no significant effect on financial performance of listed commercial banks in Kenya.

Table 4.11: Performance and Online banking

```
. regress Performance Online
```

Source	SS	df	MS			
Model	8.0380e+11	1	8.0380e+11	Number of obs =	55	
Residual	1.4791e+15	53	2.7907e+13	F(1, 53) =	0.03	
Total	1.4799e+15	54	2.7405e+13	Prob > F =	0.8659	
				R-squared =	0.0005	
				Adj R-squared =	-0.0183	
				Root MSE =	5.3e+06	

Performance	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Online	97.9387	577.0849	0.17	0.866	-1059.547	1255.424
_cons	7112488	1181651	6.02	0.000	4742395	9482580

ANOVA statistics revealed that online banking and financial performance of the bank were not significantly associated since it had a significance value of 0.8659. the F critical value was greater than the F calculated ($0.03 < 2.434$), indicating that there is no significant association between online banking and how commercial banks listed in the NSE performed financially. The p value which was greater than 0.05 an indication that online banking does not significantly influence financial performance of individual banks (Critical value = 2.434). The value of R^2 was 0.0005; this indicates that at 95% confidence interval, there were 0.005% changes in financial performance of commercial banks due to changes in online banking. This implies that online banking can explain 0.05% changes in how commercial banks perform. Therefore the null hypothesis is accepted that online banking does not significantly affect financial performance of listed commercial banks in Kenya

From the finding of the study the established equation was between financial performance and Agency banking was;

$$Y = 7112488 + 97.9387 X_1$$

From the above regression equation, if online banking is held to a constant of zero, financial performance of commercial banks would be at 7112488. Increasing online banking by a single unit results to an increase in how commercial banks perform financially by 97.9387.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents and discusses the key data findings from the study, draws conclusion from the findings, and makes appropriate recommendations. The conclusions and recommendations drawn focused on addressing the major objective of the study. The researcher intended to examine the effect of electronic banking on financial performance of listed commercial banks in Kenya.

5.2 Summary of Findings

5.2.1 Mobile Banking and Financial Performance

On the correlation analysis it was noted that financial performance of commercial banks and m-banking were strongly and positively correlated as represented by correlation factor of 0.6902. From the ANOVA statistic the study found that the F critical was less than F calculated ($2.434 < 48.22$), an indication that m-banking and financial performance of commercial banks listed in the NSE are significantly related. The study revealed that 48.22% of change on financial performance of commercial banks could be explained by changes in m-banking. From the regression analysis the study established that a unit increase in mobile banking would result to an increase in financial performance of commercial banks by 49.5138. The findings concur with Koivu (2012) who stated M-banking in Kenya impacts financial performance, character and decisions of the entire economy. The trend of continuous reliance on m-banking to the execution of money transactions is picking up the pace in a steady manner in the financial sector. The study finding were in agreement with the findings of Mbiti and Weil (2011) who found that mobile banking has therefore improved access to financial services in the most developed and developing countries, hence the performance of the bank.

5.2.2 Agency Banking and Financial Performance

From the correlation analysis, the study found a strong positive correlation between financials performance of individual commercial bank and agency banking as shown by correlation coefficient of 0.6696. From the ANOVA statistics, it was noted that the calculated F value was found to be greater than F critical value ($43.09 > 2.434$), this is an indication that there was a significant relationship between agency banking and financial performance of commercial banks listed in the NSE. The value of R square was 0.4484, this indicated that there was variation of 52% on financial performance commercial banks due to changes in mobile banking at 95% confidence interval. This shows that only 44.84% of the changes on financial performance of commercial banks could be accounted for by changes in agency banking. From regression analysis, it was found that a unit increase in agency banking would lead to increase in financial performance of commercial banks by 29749.79. The findings concur with Aduda and Kingoo (2013) who established that of the forty-three commercial banks in Kenya banks, eight had already rolled out the agency banking service. The results further established that annual performance rose positively and significantly between 2008 to 2011.

5.2.3 ATM Banking and Financial Performance

On the correlation the study found a strong positive correlation between financials performance of individual commercial bank and agency banking as shown by correlation coefficient of 0.6696. On the analysis of variance the study found that there was a significant relationship between ATM banking and financial performance of the bank. The calculated F value was found to be greater than F critical value ($57.61 > 2.434$), this is an indication that there was a significant relationship between ATM banking and financial performance of commercial banks listed in the NSE. The study found that R square was 0.5208, indication that there was variation of 52% on financial performance commercial banks due to changes in ATM banking. On the regression analysis it was found that a unit increase in ATM banking would lead to increase in financial performance of commercial banks by 50316.87. The findings concur with Mahdi and Mehrdad (2010) who argued that ATMs banking will causes a reduction in cash circulation, the improvement in how efficient banking institutions

are, a decrease in client banking transactional costs, bank costs decrease. Mahdi and Mehrdad (2010) concludes that ATMs banking will causes a reduction in cash circulation, the improvement in how efficient banking institutions are, a decrease in client banking transactional costs, bank costs decrease.

5.2.4 Online Banking And Financial Performance

From the finding on the correlation analysis, it was found that there was a weak positive correlation between financial performance of individual commercial bank and online banking as shown by correlation coefficient of 0.0233. On the analysis of variance it was noted that there was no significant relationship between online banking and financial performance of the bank. The calculated F value was found to be less than F critical value ($0.03 < 2.434$), an indication that there was no significant relationship between online banking and financial performance of commercial banks listed in the NSE. The study found that value of R square was 0.0005, an indication that there was variation of 0.05% on financial performance commercial banks due to changes in online banking. On the regression analysis it was found that a unit increase in online banking would lead to increase in financial performance of commercial banks by 97.9387. The findings concur with Ram, Kagan and Lingam (2008) who noted that the increased usage of internet in banking has an additional channel of the bank marketing its services and products had significantly improved the community banks performance financially. Further product innovation improves how commercial banks perform financially. The study findings also agreed with the finding of Malhotra and Singh (2009) did a study on the effects of online banking on how commercial banks performed and risk established that on average online banks are bigger, more operationally efficient and profitable.

5.3 Conclusion

The study established that m-banking has a positive effect on how listed commercial banks in Kenya perform financially. The study further established that mobile banking and financial performance of listed commercial banks in Kenya were strongly and positively related.

Based on the study's findings, the study concludes that m-banking strongly and positively affect financial performance of listed commercial banks in Kenya.

From the findings the study concludes that agency banking has a positive effect on financial performance of listed commercial banks in Kenya, as the study established that agency banking and financial performance of listed commercial banks in Kenya were strongly and positively related. The study also established that a unit increase in agency banking would lead to increase in financial performance of listed commercial banks in Kenya.

The study established that a unit increase in ATM banking would lead to increase in financial performance of commercial banks listed in the NSE. The study further established that financials performance of individual commercial bank and agency banking were strongly and positively correlated. Based on the findings, the study concludes that ATM banking strongly and positively affects financial performance of listed commercial banks in Kenya.

The study found that financial performance of individual commercial bank and online banking was weakly but positively correlated. The study further established that online banking and financial performance of commercial banks listed in the NSE were positively related. From the findings, the study concludes that online banking has a positive effect on financial performance of listed commercial banks in Kenya

5.4 Recommendations

The study recommends commercial banks to expand their electronic services in a planned and well-articulated strategy for the long run; this will increase clients' satisfaction and also increase the institutions profits. The banks are also requested to carry out awareness and promotional campaigns to ensure that their customers are aware of the benefits of using e-banking.

The study revealed that the use of e-banking leads to an increase in performance of the bank. The study recommends that the banks must be focused in terms of their needs and using the right technology to achieve goals, rather, than acquiring technology of internet banking

because other banks have it; this will help the bank to steer its vision in the right direction which is growing the trends of ICT.

The study recommends banks management which aren't fast when it comes to adopting new innovations, to step up and embrace the different kinds of innovation in their banking operations this will boost their profitability. In Kenya, the highly profitable banks are the ones that are fast in terms of adopting new technologies, therefore this recommendation is worth.

The study recommends for policy makers to review those policies that are related with promoting the adoption of innovation and transferring of technology. The government needs to encourage the adoption of innovations this will boost profits of organizations and the government will convert to better tax revenues.

5.5 Areas for Further Study

The study sought to examine the effect of e-banking on financial performance of listed commercial banks in Kenya. The study recommends replication of the study should on commercial banks not listed in the NSE. The study also recommends a study to be done on challenges faced by commercial banks in Kenya in adopting e-banking.

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APPENDICES

Appendix I: Data Collection Sheet

	2013	2014	2015	2016	2017
Net profit after tax					
Total assets					
Number of ATMs					
Mobile banking loans					
Number of agents					
Amount transacted online					

Appendix II: List of Listed Commercial Banks in Kenya

1. Co-operative Bank of Kenya Ltd
2. Diamond Trust Bank Kenya Ltd
3. Equity Bank Ltd
4. I and M Bank Ltd
5. Kenya Commercial Bank Ltd
6. National Bank of Kenya Ltd
7. NIC Bank Ltd
8. Barclays Bank of Kenya Ltd
9. CFC Stanbic Bank Ltd
10. Standard Chartered Bank Kenya Ltd
11. Housing Finance Group

Source: NSE (2018)