

**EFFECT OF ELECTRONIC BANKING ON THE OPERATING
COSTS OF COMMERCIAL BANKS IN KENYA**

CATHERINE WANJERI MACHARIA

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DECLARATION

This research project is my original work and has not been presented for examination in any other university.

Signature..... Date.....

This Research project has been submitted for examination with my approval as university supervisor

Signature..... Date.....

Dr. Mwangi Cyrus Iraya

Chairman, Department of Finance and Accounting

School of Business

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DEDICATION

This research is dedicated to my parents for their support and constant push throughout my journey in pursuit of knowledge. They have been a pillar and this would not have been possible without them.

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ABBREVIATIONS

ANOVA	:	Analysis of Variance
ATM	:	Automated Teller Machine
BI	:	Behavioral Intention
CBK	:	Central Bank of Kenya
CIR	:	Cost to Income Ratio
EBG	:	Ecobank Ghana Limited
FY	:	Financial Year
GCB	:	Ghanaian Commercial bank
IT	:	Information Technology
KCB	:	Kenya Commercial Bank
KEPSS	:	Kenya Electronic Payment and Settlement System
KSH	:	Kenya Shilling
NIM	:	Net Interest Margin
OLS	:	Ordinary Least Square
POSs	:	Point of Sale
RDT	:	Resource Dependence Theory
RDT	:	Resource Dependence Theory
ROA	:	Return on Assets
ROE	:	Return on Equity
SMS	:	Short Message Service
SPSS	:	Statistical Package for the Social Sciences
TAM	:	Technology Acceptance Model

TRA : Theory of Reasoned Action

USA : United States of America

VIF : Variance Inflation Factor

ABSTRACT

A challenge for Kenya's Commercial banks has been increasing in operational performance. The operational costs in Kenya have been on the increase; the total operating costs rose by a 6.4% to KSh 158.7 billion in 06/2018 from KSh 149.1 billion in 06/2017. The cause of increase in operating costs was rise in deposits interest, that was as a result of increased deposits by clients by a 10.5% in the course of the span to 06/ 2018. Deposits interests, staff expenses as well as other costs were the major constituents of the cost of operating, being an account for 33.8%, 25.3% and 23.7 % of sum costs, respectively (CBK report, 2018). The key research objective was to determine the impact of electronic banking on the operating costs of Kenya's commercial banks. A descriptive study was used. The population that was targeted for this research was 42 Kenya commercial banks. The research collected secondary data by use of a sheet for collection of data. This data was collected from the Kenya commercial banks financial statements with a 5-year duration from 2014 and 2018 where data was obtained annually. SPSS was used for analysis of this data where diagnostics tests and inferential statistics in form of regressions, correlations and ANOVA were performed. The study concluded that there was a positive correlation coefficient between operating cost and automatic teller machine which was statistically significant. The study further concluded that there was a strong positive correlation between internet banking and operating costs. It was concluded that there was a strong negative correlation between mobile banking and operating cost. The study concluded there was a positive correlation between bank size and operating cost. Finally, it was concluded there was a negative correlation between capital adequacy and operating cost. The study recommended that there is need for commercial banks to reduce the cost of maintenance of the ATM. There is need for commercial banks to invest in cheaper but efficient systems that prevent and reduce internet fraud and cyber-crime since this may reduce the operational cost of commercial banks. There is need for commercial banks to enhance the mobile banking platform and also collaborate with the various mobile telecommunications firms in reducing the costs involved in mobile bank transactions. The commercial banks in Kenya should consider merging as this will enhance synergy and which in turn may reduce operational costs of the banks. The commercial banks in Kenya should ensure that they hold the right amount of capital necessary to facilitate their operations as this reduces the operational risks and costs.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In the 21st century, the banking sector is deemed to operate in a competitive and complex environment as a result of the unpredictable and ever-changing economic conditions. The current banking environment has witnessed tremendous changes due to improvement in technology, demands for banks to serve their customers electronically as well as reduce their operating costs. Banks have resorted to technology harnessing to improve their services and products leading to reduction of costs of operating. There has been revolutionization in banking due to electronic banking which has resulted to evolution of the traditional banking sector into a vibrant business (Al-Jabir, 2016). The transformation implies that the banking sector has continued to invest heavily in information technology (IT) products and services. Many banks are motivated by the Electronic banking development to lay emphasis on reduction of operating costs in order to stay ahead. Now, electronic banking establishes a significant component for the banks today but the extent to which it contributes to cost reduction has not been clearly established (Okoro, 2014).

The Technology Acceptance theory, Innovation Diffusion theory and the Resource Dependence theory will form the major theme of this study. Davis (1989) was the pioneer of the Technology Acceptance theory and argues that usefulness perception and convenience of usage perception measures people`s acceptance of new technology. E banking is greatly directed by the visions of decreasing costs of operating and increasing revenue which offer value to the commercial banks. The new idea of diffusion or adoption in a social system is explained from the Innovation Diffusion Theory by

Roger's (1983). The aspects determining the innovation incorporation are outlined in this theory which are complexity, relative advantage, observability, trialability, and compatibility. Five stages have been given to summarize the process of adoption of innovations; Awareness, persuasion, decision to adopt or reject, testing and adoption (Roger's, 1983).

The adoption of electronic means of transacting has largely been occasioned by the relative advantage and overall benefits banks and clients expect to reap compared to traditional banking. By adopting technology banks have reduced costs of distribution. This way, the collecting, processing, transmitting and archive of data by bank employees in the offices of the branch is replaced by the automated processes. No entity or company is capable of securing capabilities and resources needed for surviving without having to interact with individuals and companies beyond their boundaries (Salancik & Pfeffe, 2012). Banks have opted to downsize the bank halls and explore the external environment by partnering with telecommunication companies which reduces its transaction costs (Maiyo, 2013).

In Kenya, the banking industry has injected huge sums of funds in implementation of the services of Electronic banking with the aim of bettering the quality of how the customers are served and reducing the cost of offering financial services (Central bank of Kenya Report, 2018). A volume of 4.39 million transactions recorded by Kenya Electronic Payment and Settlement System (KEPSS) worth Ksh 27,742 billion in FY 2016/2017 compared to transactions worth Ksh 29,112 billion in financial year 2017/2018. There was an increase in total operating costs by 6.4% to KSh 158.7 billion in 06/ 2018 from KSh 149.1 billion in 06/2017. The rise in operating costs was as a result of the rise in

deposit interests that happened as a result of a rise in deposits by clients by a 10.5 % in the course of the span to 06/2018. The key components of operating costs were staff costs, interest on deposits and other expenses included, accounting for a 33.8%, 25.3 % and 23.7 % of all the expenses, respectively (Central bank of Kenya Report, 2018).

1.1.1 Electronic Banking

It alludes to provision of small value and retail banking, large worth electronic payments as well as other wholesale services and products of banking offered electronically (Gonzalez, 2016). Maiyo (2013) further illustrates it as the connection of electronics between the client and the bank for purposes of preparing, controlling and managing the transactions involving money. Additionally, E-banking alludes to the process in which a client pursues the transactions of banking by use of electronics without having to go to any institution. According to Kricks (2015) E-banking as well is referred to as the automated delivery of conventional and new products and the services of banking straight to clients electronically.

This service is not just an innovation process which enables the present banks to concentrate on the core operations of the bank increasing their effectiveness; the presence of branch and virtual office has noteworthy impacts on the banks and client interactions (Rai & Allen, 2017). As highlighted by Kricks (2015) the establishment of the service had not abolished the traditional services and products of banking but instead advanced the models towards improving the delivery of services, real time accessibility and finally achieving optimum efficient operations of the bank. Traditional banking has not been replaced by E-banking but instead improved on speed, quality service delivery and

decreased cost. Electronic banking offers a variety of channels ranging from ATMs and POSs to mobile, telephone and internet banking which have multiplied banking transactions (Ghodrati & Khah ,2014).

There are three Electronic banking types that comprise; Mobile, Smart card and Internet banking. In Internet banking, instructions of clients are served through internet where clients are capable of enjoying the services of banking from wherever they are either at homes or places of work or elsewhere. Maiyo (2013) indicated that conducting banking services by using mobile or fixed wireless phones is called mobile banking .It also involves the use of SMS or voice in passing instruction to the computer; it then decrypts that message and implements instructions by use of a device that is highly coded then after, feedback returned to the client electronically. Smartcard banking is identified as the electronic cards usage like Value Card, Debit Card, ATM Card and Credit Card. The system of smart card enables clients' easy accessibility to cash, transferring and making enquiries about their accounts having not to visit the halls of banking (Ghodrati & Khah, 2014).

1.1.2 Operating Costs

These are the expenses incurred in the daily running of an enterprise, such costs include; administration and sales, as opposed to production. They can also be referred to as operational expenses (DeYoung, 2012). Operational costs can be described as the costs which are related to the business operations, the operations of a device, constituent or an equipment. In a commercial enterprise, operational costs may be categorized into variable and fixed costs. Fixed costs refer to the costs which remain same whether the operations

are closed or running at hundred per cent while variable costs may increase depending on whether more production is done, and how it is done. Variable costs are therefore the costs which can be managed depending on how their cost drivers are handled (Allen & Santomero, 2014).

A company determines whether expenses are estimated accurately by the help of operating cost management and which is instrumental in predicting future expenses. There is monitoring of any extravagance and it's avoided or approved for future projects in the case where the cost is deemed necessary (Kirk, 2015). The management of costs of operations may not be utilized solely, it is a must to organize and tailor operations having a strategy in place, thus the essence of having a strategy of managing costs. In case the processes of an organization are clearly and fully defined, this enhances successful costs management. Effective operating strategies of managing costs assists in delivering effective outcomes in the budget allocated to an organization. Cases of unexpected costs arising cannot be completely eliminated but preparation on the basis of management of cost have a likeliness of making them easier in solving them where they happen (Gonzalez, 2016).

The key success factor in operating cost management is looking at the right sections and decision making based on real facts on the cost items. Firms are not supposed to try using every strategy since there's not any sole strategy is a solution to all. Rather, they are supposed to selectively match and mix the strategies (Gonzalez, 2016). The strategies that can be adopted by a company to manage costs include employee layoffs, job elimination, organizations structural changes, employees' compensation reduction, employees' benefits reduction, advertisement reduction, process redesign, shared services,

outsourcing and customers' reorganization (Kenyoru, 2013). Categorically these strategies can be applied across all business functions or individual departments. These departments include sales, support, marketing, and service, operations and procurement that is determined by total operating cost over the total revenue for each financial year.

1.1.3 Electronic Banking and Operating Costs

Commercial banks that are met by globalization pressure and also competition pressure from the non- banking players are supposed to look for new means of adding value to service while managing their costs of operating. Banking is not just termed as the business of handling monetary transactions, but as a business linked to the information on transaction of finances as well (Kambua, 2013). Electronic banking pursues a key part in giving quality services at less expenses thus cutting down the costs of bank operations. Several services of electronic banking like the ATMs, mobile and internet banking, credit cards and smart cards have offered various services that are convenient to the client, when the quality of a service is enhanced, bank's operational costs also improve. Banks may cut down the number of workers in customer service through electronic banking, as clients utilize functions of self-service. Increase in electronic payments is due to less costs of processing a cheque. Presentation of the disclosures and statements of the bank is conducted online and assists in reducing mail costs and costs of distributing paper, hence decline in entry of data as clients complete and process applications online (Calomiris, Heider & Hoerova, 2015).

E-banking services have reduced banking costs as indicated by Nathan (2013) and as highlighted by Allen and Hamilton (2012) \$1.07 is the cost approximated in provision of

daily business of a whole branch service in the US for every transaction in contrast to banking through the mobile is 54 cents while banking through the ATM is 27 cents and banking through the Internet is 1.5 cent. Conversely, the benefits for clients are quite a number and they are; time conservation, costs reduction while using and accessing the different service and products of banking, comfort and convenience. A recent research was done in Kenya and showed, there's a steady rise in usage of the technologies of e-banking technologies like internet and mobile banking, ATM, direct payments of bill, credit card and electronic transfer of money (Central bank of Kenya Report, 2018).

Since Kenya's establishment of the e-banking products, many benefits have been witnessed by institutions of financing in terms of cost savings. Lin, Hu and Kang (2015) studied the electronic banking effect on the efficiency of costs in commercial banks: an empirical research in Asian countries. It was noted that where a bank has many branches, there is a likeliness of being very inefficient. Sakoe and Asare (2015) researched on the effects of E-banking on the services of financing in the country of Ghana. They pointed out, E-banking gave banks room for reducing cost because delivery of services is efficient and quicker with the help of less personnel. Locally, Mateka, Gogo and Omagwa (2016) on the effects of E-banking on how the listed Kenya's commercial banks perform. Kenya noted, E-banking has minimal monitoring, operating and maintenance costs. This implied that increased incorporation of E-banking has several advantages in financial institutions in terms of cost saving.

1.1.4 Commercial Banks in Kenya

They are legally established institutions of financing for receiving funds from people, institutions and businesses and lending them money. Central Bank of Kenya (CBK) regulated, supervised and licensed their operations are by (CBK Report, 2018). The sector of banking of Kenya consisted of 42 commercial banks in FY ending 30/06/2018. The banking industry in Kenya comprises E-banking innovations; ATM, Internet banking, mobile phone banking, and Agency banking. The operational costs of Kenyan banks have reduced these E-banking services. For purposes of improving the operational efficiency, Kenya's commercial banks have been riding on the digital revolution. The rise in transactions conducted through alternative channels and out of bank branches was due to increased adoption of alternative channels of transactions, which have been decreased to addressing transactions of higher value as well advisory services, hence reducing operations of the front-office, which also led to reduction of the employee needed and cutting down the expenses of operating thus enhancing the efficiency of operation (Cytonn Report, 2019).

The Kenya commercial banks have injected huge money volumes for purposes of implementing the services of virtual and self-banking with an aim of improving the customer service quality (Gogo & Omagwa, 2016) that's why they have exponentially incorporated the usage of e-banking provision of service. Common embodiments of electronic banking include: SMS or mobile banking, electronic transfer of funds, POS banking (Debit and Credit cards), telephone banking, Interactive TV, personal computer (PC) banking, ATMs, and branchless banking (CBK Report, 2018). By 2018 Kenya

Electronic settlement and payment System registered transactions of KSh 29,112 billion in contrast to transactions of KSh 27,742 billion in 2017.

Due to the investments made in the Kenya's sector of banking and increase in the customer base, the operating costs have been increasing over the years. However, there is a registered advancement in the sector of banking in efficiency of operations since the cost-income ratio declined from 61.1% in FY'2017 to 57.3% in FY'2018, amidst the measure of rationalizing cost like the closure of branches, laying off staffs in plans of in voluntary retirement and strategies on digitization focused on cutting down the costs of operating (Cytonn Report, 2019). There was an increase in total operating costs by 6.4% to KSh 158.7 billion in 06/ 2018 from KSh 149.1 billion in 06/2017. The rise in operating costs was as a result of the rise in deposit interests, that happened as a result of a rise in deposits by clients by a 10.5 % in the course of the span to 06/2018. The key components of operating costs were staff costs, interest on deposits and other expenses included, being an account for a 33.8%, 25.3 % and 23.7 % of all the expenses, respectively (Central bank of Kenya Report, 2018).

1.2 Research Problem

Increased competition and pressure of globalization have compelled commercial banks to establish innovative ways of improving their services while managing their operational costs. Provision of better services at lower cost is as a result of electronic banking, hence reducing bank's operating costs. E-banking enables considerable reduction in transaction costs which also helps enhance efficiency of operations hence reducing other costs that may come up due to inefficiency problems according to Central bank of Kenya Report

(2018) banks may reduce the staff giving service to customers since clients utilize more the functions of self-service through electronic banking. An increase in electronic payment, there's less costs of processing a cheque. There has been reduction of paper expenses and distribution of mail as presentation of disclosures and statements of the bank are done online, hence less entry of data since customers process and complete applications online (Wright & Ralson, 2012). Thus, Kenya's commercial banks are encouraged to incorporate E-banking in order to reduce their operational costs while at the same time meeting the demands of their customers so as to improve their performance (Asare & Sakoe, 2015).

A challenge for Kenya's Commercial banks has been increasing in operational performance. The operational costs in Kenya have been on the increase; the total operating costs rose by a 6.4% to KSh 158.7 billion in 06/2018 from KSh 149.1 billion in 06/2017. The cause of increase in operating costs was rise in deposits interest, that was as a result of increased deposits by clients by a 10.5% in the course of the span to 06/ 2018. Deposits interests, staff expenses as well as other costs were the major constituents of the cost of operating, being an account for 33.8%, 25.3% and 23.7 % of sum costs, respectively (CBK report, 2018). Regardless, the Kenya's banking sector has registered an enhancement of efficiency in operating since the ratio of cost to income lowered from a 61.1percent in FY'2017 to a 57.3per cent in the FY'2018 amidst the measure of rationalizing costs like laying off staffs in voluntary plans of retirement, closures of branches and the digitization approaches focused on cutting down the costs of operating (Cytonn Report, 2019). There is therefore need to establish the effect that E-banking has

had on operating costs in Kenya as it's not clear whether the improvement in operating efficiency has been as a result of adoption of E-banking.

The impact of electronic banking on efficiency of costs of the commercial banks was studied by Kang, Hu and Lin (2015), which was an empirical study in Asian countries. It was noted that the more branches of the bank there happen to be, there is a likeliness of the banks being quite inefficient. Normally, the inefficiency in costs of a bank was greatly higher having a rise in figures of systems of electronic banking. However, the above study was a global study and its context may be different from Kenya. Sakao and Asare (2015) researched on effects of electronic banking on the services of financing at Ghana. E-banking was pointed out for enabling banks to cut down expenses because services are now efficiently and quickly delivered with help of less employees. However, this study was in the regional context and focused on financial services while the current study seeks to focus on operating costs. Locally, Mateka (2016) on impacts of E-banking on how the listed Kenya's commercial banks perform noted, E-banking had minimal monitoring, maintenance and operating costs. Whereas the current study seeks to focus on operating costs, however, the above study focused on the financial performance. There are mixed findings on the effect of E-banking and operating costs, hence the research is aimed at filling the available literature gap through addressing this question; what's the effect of electronic banking on the operating costs of Kenya's commercial banks?

1.3 Research Objective

The key research objective was to determine the impact of electronic banking on the operating costs of Kenya's commercial banks.

1.4 Value of the Study

The research is going to help in theory; Technology Acceptance theory as it seeks to ascertain the economic value anticipated by E-banking adoption particularly operational costs in Kenya's sector of banking. The theory of Innovation Diffusion as it explains a person's intention to adopt a technology. This will help determine the challenges associated with process of innovation diffusion and the benefits that come with innovation. The Resource Dependence theory as it explains how commercial banks harness resources via E-banking adoption to enhance operating cost reduction.

The study finding provide knowledge to makers of policies in the sector of banking on anticipated electronic banking impact on the costs of operating; this would aid in proper the design of policies on electronic banking operation and incorporation amongst Kenya's commercial banks. The research finding would be also significant to all the managers of Kenya's commercial banks since it is going to help them make decisions at their various levels on which electronic banking system to strengthen and anticipated outcomes of electronic banking on costs of operating.

The future researchers and scholars will benefit as they are going to have the capacity of increasing their comprehension of the theories used in the study. They will also benefit by increasing their knowledge of the effect of electronic banking and operating costs. The research is going to be a reference source material to the researchers and scholars who might want to conduct a study on this field.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This topic covered the empirical and theoretical reviews of the existing literature on the effects of electronic banking on the operating costs of commercial banks. Various theories and empirical studies on the research topic were reviewed, conceptual framework outlined and the summary of the done literature. The theoretical review boosted comprehension of the existing knowledge body on the subject under review. The empirical review on the other hand brought out the findings of other researchers who had studied the topic and their recommendations.

2.2 Theoretical Review

This is the research theoretical foundation. The finding of any research is often based on existing hypothesis and theories. The theoretical review focused on three theories; Technology Acceptance model, Innovation Diffusion theory and the Resource Dependence theory.

2.2.1 Technology Acceptance Model

Davis (1989) posits that this theory gives an explanation of the behavioral intent of a prospective user to using technological innovation. TAM has its basis from Reasoned Action Theory, a theory of psychology which aims at explaining behavior getting to two basic predictors; perceived convenience in usage and perceived usefulness. Davis (1989) posits that this theory contends that acceptance of people to the new technology is measured by two technological perceptions: usefulness and convenience in usage. The

usefulness perception mirrors the subjective possibility of the potential user that the application of the new technology is going to be of benefit to them personally and the health of the organization and conversely convenience in usage perception is an essential aspect in determination of innovation adaptation.

TAM basic goal is providing a general description of aspects that impact on acceptability of the technology of E-banking. Additionally, the model aids practitioners and researchers in identifying the reason for unacceptability of a certain system (Davis, 1989). Davis (1989) proposed that the use of a system of information is mostly measured by behavioral intent to utilize it, that then is affected by the user's attitude to utilizing it and the system's usefulness perception. Attitude and usefulness perception are as well influenced by the convenience of usage perception. The fundamental role played by the convenience of usage perception in adoption of IT renders it important to comprehend the factors contributing those aspects which add on to the experience of the user.

A limitation of TAM theory regards the variable pertaining to the users' behavior, that unavoidably is assessed through personal means like the behavioral intent (BI) and influence to the person (Ang, Ramayah & Amin, 2015). The relevance of this theory is that it aims at ascertaining the expected commercial value by adopters of E-banking and is going to assist in ascertaining whether E-banking enhances the costs of operating in Kenya's banking sector.

2.2.2 Innovation Diffusion Theory

The theory was established by Roger's (1983), and the Innovation Diffusion Theory explains how a fresh concept is diffused or adopted in a social system. The important

factors determining the innovation incorporation include: observability, relative advantage, complexity, trialability and compatibility (Rogers, 1995). Five stages have been given to summarize the process of adoption of innovations; Awareness, persuasion, decision for adopting or rejecting, testing and adoption. The theory aims at explaining the why, how and which rate technology and fresh ideas diffuse across cultures. Rogers describes diffusion being the incorporation of innovation for a period of time by the provided social system. Consequently, processes of diffusion lead to the penetration or acceptability of a fresh concept, physical innovation or behaviors. Rogers recognized 5 attributes to innovation which are important influencers to behavior adoption and are key influences on behavior adoption; observability, relative advantage, complexity, trialability and compatibility (Okoro, 2014).

Managers are advised by Corbitt and Barnes (2013) on the essence of comprehending the capacities of a certain technology as well as advantages coming from its usage. This assists in determining the type of technology to be used for their activities, limitations and costs linked to operating the technology. The use of three dimensions when considering what type of technology to adopt is highly advocated for by Pento, Mattila and Karjaluoto (2012) as the degree of automation, that is the extent to which the technology can operate without human involvement; the scale of technology, that is, its processing capacity; and, the degree of integration the extent to which separate pieces of technology are connected to each other.

This approach is however borrowed from the theory of marketing and development of a fresh product in which both have an assumption; users incorporate fresh technology for utility maximization (Haggman, 2009). This theory's relevance to the research is that it is

going to show the importance of E-banking and also boost understanding of associated costs and limitations when adopting E-banking so as to ensure its effectiveness in enhancing operating cost reduction in commercial banks.

2.2.3 Resource Dependence Theory

This theory proposes, no firm or entity can safeguard the resources and capacities of surviving without having to interact with individuals and companies above their limits (Salancik & Pfeffer, 1978). An overview on the relationships of inter-organizations given by this theory and the way their establishment assist in reducing uncertainty (Collins, Withers & Hillman, 2015). Collins, Withers and Hillman (2015) in addition assert, those relations just absorb a number of the encountered uncertainties by firms in the environment of doing business. Corbitt and Barnes (2013) indicated the resources concept entails all information, assets, processes of the organization, capabilities, attributes of a firm, knowledge and many more, regulated by a company which allows companies to consider and adopt strategies which enhance its effectiveness and efficiency.

Three factors determined by Pfeffer & Salancik (1978) had an impact on the organizations' dependence level on certain resources. Firstly, the general essence of that resource to the company was vital in determination of the level of the firms' dependence on the resource. The 2nd aspect was scarcity of the resource. The more scarce a resource was, the more dependent the company became. Finally, competition between organizations in order to control that resource was also another factor influencing resource dependence. RDT upholds, organizations happen to be insufficient in terms of

resources, for purposes of acquiring and sustaining resources that they target from their external atmosphere (Hillman, Withers & Collins, 2015).

There however exist a number of uncertainties in the model of resource dependency, specifically regarding limited absorption (Piskorski & Casciaro, 2005). Resource Dependence theory will help in ensuring that there are right resources for E-banking adoption in order to cut down the operating costs of Kenya's commercial banks.

2.3 Determinants of Operating Costs

This part of literature explores determinants of operating costs.

2.3.1 Electronic Banking

Frenzel (2016) indicated ATM is an innovated mode of delivering varied services like withdrawal of cash, depositing cash, transferring funds, utility payments, requests of cheque book, credit card bills as well respond to enquiries concerning funds. The machines serve the primary tasks of withdrawing and depositing done by tellers, that consequently cuts down the costs of operating (Frenzel, 2016). ATMs continue to enjoy acceptability by bank clients because they have the capacity of offering services similar to those offered by bank tellers and therefore cutting down the consumed time in the banking halls. As Tufano (2014) notes, ATMs tend to be a very cost-effective means of generating higher output as they accomplish greater outputs over a specific time period as compared to tellers. In addition, unlike teller who take breaks, ATMs serve non-stop hence ensuring continued output for banks even past the hours of banking (Ceylan, Emre & Asli, 2014).

Facilities of provision like transferring funds, Internet banking involves accessing accounts purchasing services and products related to funds online (Tarkka, 2015). Through the internet assistance, banks have the capacity of penetrating the markets of funds without being physically present in the markets (Young, Lang & Nolle, 2014). Therefore, this is viewed as a better method by banks for serving its broad and growing clientele with efficient, fast, convenient and quality services. It is believed improve cost efficiency and good yields for the banks therefore resulting to profitability. Internet banking selection results to reduction of expenses and then the likeliness of extending the profitability of banks. Banking through the internet has resulted to remarkable speed in the system of banking, and plays a major role in globalizing the system of banking (Ceylan, Emre & Asli, 2014).

Banking through the mobile may be explained as the capacity of conducting transactions by the bank by use of mobile phones. Over previous several years, banking through the mobile has developed unceasingly from a simple model of information delivery to a transaction channel of banking where a number of services of the bank can be reached. The application of banking through the mobile adds on to the reduction of cost and thus the firm's performance. increasing market share, satisfaction of customers, expanded range of products, tailored products as well as better reaction to the demands of customers have been witnessed. Ndung'u (2015) pointed out that banking from the mobile has advanced the business of transferring money and it has resulted to continued automations which have reduced the costs of transaction for the clients and the banks. This revolution of the business of transferring money has resulted to the decrease in costs of operating, more profits and income to Kenya's commercial banks.

2.3.2 Size of the Bank

Larger banks leverage on their size to enjoy economies of scale which in turn reduces their operating cost. These include merits associated with cost savings through dispersion of costs that do not rise in proportion to increase in size. Economies of scale advantages are also derived through product diversification where the large banks are able to vary the product mix, they offer to their different customers and hence attract more customers and reduce risk (Hughes & Mester, 2016). Kolodinsky, Hogarth and Hilgert (2014) noted that some measures of bank size such as assets significantly explain the operating cost of a bank. The larger banks can also rely on their size to strike advantageous financial deals such as cheaper financial resources. Larger banks leverage on their size and pool of resources signalling stability to negotiate financial deals from a favourable position. Operating cost efficiency is also much easier to achieve with increased bank size (Banz, 1981).

2.3.3 Capital Adequacy

Capital is a factor that affects the costs of operation of the commercial banks. It's the sum of available fund for supporting the business of the bank and serves as a security for adverse cases or circumstances (Brissimis, Athanasoglou & Delis, 2016). Capital adequacy alludes to the capital levels needed by the banks for enabling them to survive risks such as operational, market and credit risks which they tend to be vulnerable to. It gives banks a room for absorbing the prospective losses as well as protecting the debtors of the bank (Phaal, Farrukh & Probert, 2015). The capital of a bank facilitates its liquidity because deposits tend to be very fragile and vulnerable to bank runs. Themba (2015) noted that as capital adequacy level rise the operating costs levels also increase as

the commercial banks have more money to spend as they increase their operations. Capital adequacy for commercial banks is determined by the value of sum loans over the total assets.

2.4 Empirical Review

Scholars have for long investigated the link between impact of the electronic banking on costs of operating. Yang et al. (2018) focused on whether electronic banking betters the performance of China's banks. Secondary data was employed for the research from books, data bases, statistical abstracts, and annual reports of companies. The collected data cover the span from year 2003 to 2013. SPSS and Excel were used for data analysis from 2 factors: Efficiency of cost and profitability of banks. A t-test was carried out to determine if there happened to be significant variances in 2 groups on ratio-scaled variable interest or on a particular interval-scaled. Based on the outcomes, e-banking did have a positive and significant impact on performance of the bank on the basis of the operating margin, ROE and ROA. In comparison, there happened to be a faintly negative effect of e-banking on banks' performance regarding efficiency and NIM. Nevertheless, the present research targets the impact of e-banking on costs of operating whereas the research above was on performance of electronic banking.

A study on the benefits of electronic Banking with a focus on Ghana by Gyabaah, Oppong and Baidoo (2015) which was a of Ghanaian Commercial bank (GCB) Bank Ltd used questionnaires and interviews as data collection tools, non-probability sampling was adopted and in analyzing data collected SPSS and Microsoft Excel were used. The population of interest was 200 customers and 25 employees of GCB Bank Ltd. The study

found out that as far as electronic banking was concerned ATM services were the most popular among users. It was followed by mobile banking or SMS. Convenience and time saving of electronic banking made customers use the banks electronic products. As a strategy, in order to increase customer knowledge and usage, awareness of GCB electronic banking services and products was recommended as being very essential. However, electronic banking coverage and benefits was focused on the above study whereas the present research targets on impacts of e-banking on operating costs.

Ugochukwu (2015) focused on effects of the services of electronic banking on the banking sector in Ghana - a case of Ecobank Ghana Limited (EBG), Accra. The population of the study was 45 employees from three branches consisting of Osu, Ring-Road Central and Labone branches. The research instruments employed as tool for collecting data for the research included; self-administered questionnaires. Analysis and presentation of data was done by use of descriptive statistics that involved basic graphical charts. Banks happen to be driven to keep on incorporating the technologies of e-Banking as a result of the rising competition amongst banks towards increasing or retaining their client base. There are some challenges regardless of the rise in e-Banking benefits. The main challenge encountered by clients consuming e-Banking products from EBG according to study is network failure from internet connection. However, respondents believed that in order to attract more customers, considerable marketing and education of the products of e-Banking from a bank can be considered. The current research looks at the effect of e-banking on operating costs while the above study focused on electronic banking services alone.

The impact of banking through the mobile on how Nigerian commercial banks perform was researched Abdul-Hakim, Khan and Bagudu (2017) and the technique of simple random was used in the research to select twenty-two commercial banks. To acquire the desired data which was employed for the research, there was use of a structured questionnaire. Analysis and presentation of data was done through descriptive statistics that involved basic graphical charts. The research concluded, cost of the services of banking through the mobile did have a positive effect on how Nigeria's Commercial banks performed. The service of banking through the mobile assisted in promoting confidence and efficiency in the system of financing therefore gaining trust from the public. The above research focused on only mobile banking as an item of electronic banking and performance while the current study focuses on operating costs.

Commercial Bank concluded that liberalization of funds and revolution of technology have facilitated innovations that are efficient on the impact of delivery of service to clients in Kenya, the channels of processing and also innovative services and products in the banking sector (Mwinga, 2014). By the results, there happened to be a positive respondents' perception inclined by introduction of products of electronic banking at the KCB banks on the basis of cost of transportation, usage terms, convenience, fast delivery of service and also time saving. Technologies of self-service in commercial banks have an impact which is reasonable on the income of Kenya's commercial banks. Nevertheless, a gap exists as the above study focused on service delivery to customers whereas this study focuses operating costs (Mwinga, 2014).

Vekya (2017) researched on the impact of electronic banking on the profitability of Kenya's commercial banks. A descriptive research design was adopted by the research.

Forty-three commercial banks in operation was the research population. A census survey was undertaken and inferential and the descriptive statistics were adopted. It was revealed by the study that transaction of the ATM did have a positive relation with how the commercial banks perform. Improved bank performance is due to increase in transactions volume. Bank profitability is positively affected by transactions of point of sale (POS). The research thus gave a conclusion, electronic banking positively influenced Kenya's commercial banks profitability. Through the research, another conclusion is, major contributors to e-banking are transactions of the ATM and POS. The research concluded, transactions through mobile don't have an impact on how commercial banks perform. Based on the above study, there exist a gap that focused on commercial profitability whereas this research focuses electronic banking effect on operating costs.

The performance of operation of the 42 Kenya commercial banks on the influence of E-banking was researched by Mbogo (2017) where an expressive survey investigation proposal was adopted and purposive sampling was used to identify operations managers who took part in the study. The study concluded that all components examined in this study including tangible products, intangible products and management support, were all essential in determining operations performance at saleable financial institutions. The study arrived at the conclusion that management support, process re-engineering, and customer service delivery all contribute to enhancing performance of operations in commercial banks. Finally, the research concluded internet banking, ATM machines and mobile banking significantly contributed to commercial banks operational performance by advancing banks performance agenda, strategic operational objectives, and acquisition of new clients. However, a gap exists as the above study focused on the E-banking effect

on operational performance whereas the present study focuses on E-banking effect on operating costs.

Njoroge and Mugambi (2018) took into consideration the impact e-banking had on how Kenya's commercial banks perform, a case study of equity bank branches in its Nairobi Central business district, Kenya. As at December 2015, Equity Bank from 10 branches in Nairobi had a population of 500 employees. A descriptive research design was espoused and SPSS was used for analysis of data. A conclusion was made on the study that mobile banking had made basic financial services more accessible, condensed the overheads of the bank and costs related to transactions. Transaction costs had been reduced mainly due to the use of debit cards, there is no need of cash transactions since money transactions is conveyed electronically. However, there is a rift between the study on E-banking effect on the financial performance and the present research which looks at on E-banking effect on operating costs.

Ahmed and Wamugo (2019) focused on innovation in financing and performance of forty-two Kenya's commercial bank where they used descriptive statistics in describing quantitative data. The research established, agency, mobile, ATM and internet banking did have a significant and positive impact on how the commercial banks performed. The research resolved, innovations in financing directly agency, mobile, ATM and internet banking impacted on commercial banks performance significantly and positively. A number of channels employed decreased banking costs, increased profitability, increased productivity and efficiency, enhanced accessibility towards services and also services quality, increased customer outreach and customer relationship management. However, a

gap exists as the above study focused on financial innovation and the performance whereas the present study focuses on E-banking effect on operating costs.

2.5 Conceptual Framework

A theoretical charter provided the connection concerning the revision variables so as to inaugurate the consequence of electronic financial transactions on the operating costs of Kenya’s institutions of financing. The independent variables are ATM, mobile and internet banking. The control variables were the bank size and capital adequacy while the dependent variable was the operating cost. This relationship is represented graphically or in a diagram (Mugenda & Mugenda, 2012).

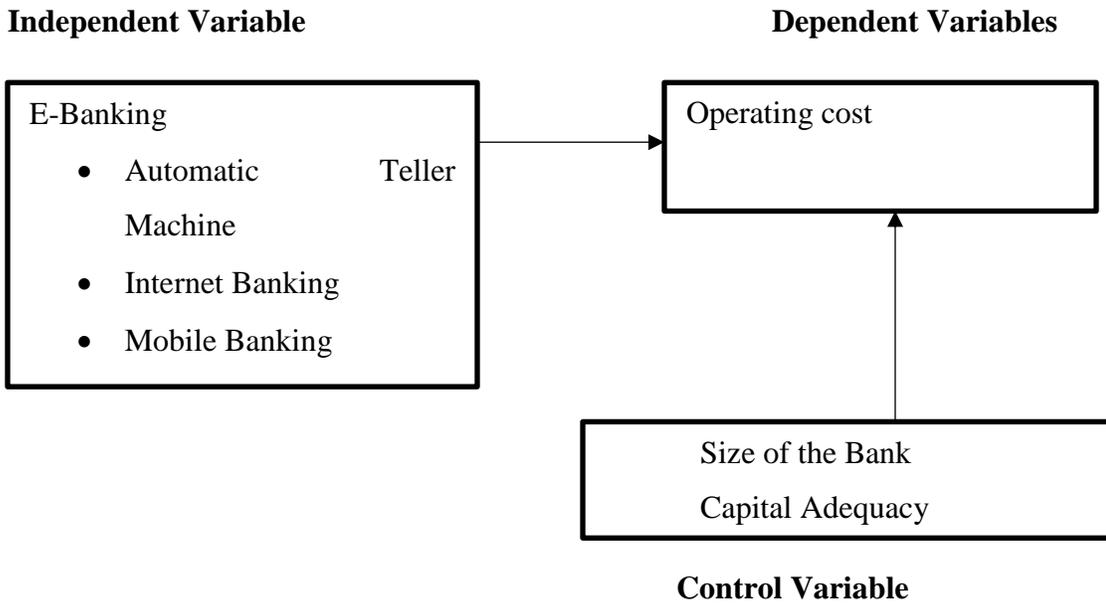


Figure 2.1: Conceptual Framework

2.6 Summary of Literature Review

The local alongside global studies on impacts which e-banking has on cost efficiency and routine of financial institutions indicate more emphasis by researchers on other areas

relating to performance compared to creating a focus around the operation costs efficiency brought about by E-banking. On the basis of ROA, ROE and operating margin, Yang et al. (2018) indicated the positive effect of e-banking on performance of a bank. Contrastively, with regards to efficiency and NIM, there happened to be just a slight negative relation effect on e-banking on how banks perform. Moreover, the study mentioned above emphasised on e-banking impact on performance whereas the current study focuses on effect of e-banking on operating costs. Gyabaah, Opong and Baidoo (2015) came to a conclusion that ATM services were the most common among users and instituted the main knowledge of customers as far e-banking was concerned. However, the current study focuses on effect of e-banking on operating costs while the above study focused on electronic banking coverage.

Transaction of the ATM positively related to how institutions of financing performed (Vekya, 2017). Improved bank performance is due to an increase in the volume dealings. Bank profitability is also positively affected by POS transactions. However, a gap exists as the above study focused on profitability of the commercial whereas this study focuses E-banking effect on operating costs (Vekya, 2017). Mbogo (2017) concluded internet banking, mobile banking and ATM machines significantly contributed to commercial banks operational performance. However, a gap exists as the above study focused on electronic banking effect on operational performance whereas the present study focuses on E-banking effect on operating costs. This study hence strives to depict the existence or nonexistence of a positive or negative relation between E-banking and Operation costs of Kenya's commercial banks.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The section outlines the overall approach employed in this research. It encompasses the research design, methods of collecting data and analysis used by the researcher in establishing the impact of electronic banking on operating costs of Kenya commercial banks.

3.2 Research Design

The design which was utilized to offer the required solutions to questions under research is a research design reiterated by Kothari (2014) and its purpose is to achieve mammoths of data from an ample population in the most effective, easy and economical way through time series, the evocative examination technique was employed (Saunders, Lewis & Thornhill, 2012). This mode enabled the researcher to scrutinize a number of variables at same duration and the researcher by this mode was able to define the various variables and conditions hence preferred (Erik & Marko, 2011).

3.3 Target Population

Tromp and Kombo (2014) outline a research population as a group of elements, individuals, services households that are well defined and are under study. The population should be homogenous and studies that use population are more representative as each member of the population can be chosen to be part of the sample used. Target population defines the specific population under study (Kothari, 2014). Kothari (2014) notes that the target population should be characterized by traits that can be observed

which help the researcher make generalizations. As at 31st December 2018 the population that was targeted for this research was 42 Kenya commercial banks.

3.4 Data Collection

Secondary data was collected by use of a sheet for collection of data. This data was collected from the Kenya commercial banks financial statements and it took a 5-year duration from 2014 and 2018 where data was obtained annually. This duration was ideal as many changes in E-banking innovations have been observed in Kenya.

3.5 Data Analysis

Tools of analyzing data used in this study hope to respond to the research query; the impact of electronic banking on the operating costs of the Kenyan commercial banks. Data that was collected from the study was edited, sorted and coded to ensure it is accurate and of accepted quality. SPSS was used for analysis of this data.

3.5.1 Diagnostic Tests

The diagnostic tests were carried out for the data so to establish whether the data is from a normally distributed population. The tests were also conducted to establish whether there was presence of heteroscedasticity and Multicollinearity.

3.5.1.1 Heteroscedasticity

Unbiasedness and linearity of the coefficient of regression are not affected by the presence of heteroscedasticity. The best property of ordinary least square (OLS) is affected by heteroscedasticity which solidifies the conclusion made when testing

hypothesis invalid. The presence of heteroscedasticity was carried out by Breusch-Pagan test (Gujarati, 2014).

3.5.1.2 Multicollinearity

Multicollinearity renders the regression coefficient unspecified and standard errors to being infinite, might be dominant amongst variables, and what matters is the degree (Gujarati, 2014). Variance inflation factor (VIF) test was employed in checking the presence of multicollinearity.

3.5.1.3 Normality

The error term is supposed to have a normal distribution with a mean of zero and the variance is supposed to be constant denoted as $\mu (0, \sigma^2)$ which is an assumption of the model of classical linear regression. In this case, the error term is used to capture all other factors which affect the dependent variables but are not considered in this model. There is an assumption that at best random the obliterated aspects have a small impact. The error term is supposed to be normal for ordinary least square (OLS) to be applied (Gujarati, 2014). For confirmation purposes the research adopted the Shapiro- Wilk to test whether the error term is normal or not.

3.5.2 Analytical Model

The model of regression was a multivariate model. The regression function had the dependent variable, independent variables and control variables as indicated below;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where:

Y= Operating cost; measured by ratio of total operating cost / Total Revenue

β_0 - Y intercept

$\beta_1 - \beta_4$ = sensitivity measure of variable X to changes in operating cost

X_1 – ATM; measured through Ratio of sum value of ATM transactions/ Total Revenue

X_2 = Internet banking; measured by Ratio of total value of internet banking transactions/
Total Revenue

X_3 – Mobile banking; determined by Ratio of total value of mobile banking transactions/
Total Revenue

X_4 – The bank size; determined by Ratio of assets/ Total Revenue

X_5 - Capital adequacy, determined by Ratio of total loans/Total assets

ε - Error term

3.5.3 Test of Significance

A T-test was employed to determine the significance of predictor variables of the research. The interpretation of p values was done at a significance level of 5% with the p value below 0.05, the variables are significant. On the other hand value of p of more than 0.05 translating to insignificance of the study variables.

ANOVA was used to determine if the model is significant at a confidence level of 95%. This test determines the difference that exists between different homogenous data. It seeks to solve the challenges that characterise the t-test and the test was used to confirm whether any linear statistical relationship exists between a dependent variable and the predictor variables.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

The current chapter will give the data analysis and the outcomes deduced from this analysis.

4.2 Descriptive Statistics

Descriptive Statistics is characterized by data analysis in a bid to provide a summary of the data in a way that is easy to understand which might also see the discovery of patterns that are part of the data.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
		Ksh	Ksh	Ksh	Ksh
		Million	Million	Million	Million
Automatic Teller					
Machine	195	473	219,971	29,872.43	42,785.06
Internet Banking	195	46.72	4,357.91	715.636	871.0989
Mobile Banking	195	4.12	8,117.68	1,124.886	1,688.576
Total Assets	195	2,610	583,213	96,167.51	12,1405.6
Volume of Lending	195	0	411,666	55,372.36	75,993.48
Total Operating					
Cost	195	55.65	21,774.69	3,541.123	4,552.102
Total Revenue	195	83.00	65831.00	9452.8103	13809.98879

Descriptive results assessing the value of automatic teller machine recoded a mean average of Ksh 29,872.43 million with the highest recording at Ksh 219,971 million and the lowest at Ksh 473 million. The mean average value for internet banking transactions was at Ksh 715.636 million with the highest recording at Ksh 4,357.91 million and the

lowest at Ksh 46.72 million. The mean average value for mobile banking transactions was at Ksh 1,124.886 million with the highest recording at Ksh 8,117.68 million and the lowest at Ksh 4.12 million. The mean average value for total assets was at Ksh 96,167.51 million with the highest recording at Ksh 583,213 million and the lowest at Ksh 2,610 million. The mean average value for volume of lending was at Ksh 55,372.36 million with the highest recording at Ksh 411,666 million and the lowest at Ksh 0 million. The mean average value for total operating cost was at Ksh 3,541.123 million with the highest recording at Ksh 21,774.69 million and the lowest at Ksh 55.65 million. The mean average value for total revenue was at Ksh 9,452.8103 million with the highest recording at Ksh 6,5831 million and the lowest at Ksh 83 million.

4.3 Diagnostic Tests

4.3.1 Testing for Normality

Table 4.2: Testing for Normality

Variable	Obs	W	V	z	Prob>z
Y	195	0.50294	72.539	9.845	0
X1	195	0.3308	97.66	10.528	0
X2	195	0.67778	47.023	8.848	0
X3	195	0.23239	112.021	10.843	0
X4	195	0.41863	84.842	10.205	0
X5	195	0.63318	53.533	9.146	0

The Shapiro- Wilsk test helped in determining the normality or the abnormality of the error term. The study's null hypothesis states that the population is normally distributed while the alternative is that it's not normally distributed. When making the conclusion if the p-value is lower than 0.05, then the null hypothesis will not be accepted and hence

there is enough evidence to deduce that the data tested did not come from a normally distributed population. The findings showed that operating cost had a (p-value=0), ATM transactions had (p-value=0), internet banking (p-value=0), mobile banking (p-value=0), the bank size (p-value=0) while capital adequacy had (p-value=0). This is an indication that all the variables used in this research had a p value of < 0.05 . Therefore, the null hypothesis will not be accepted meaning that the tested data was not from a normally distributed population.

4.3.2 Test for Multicollinearity

Table 4.3: Test for Multicollinearity

Variable	VIF	1/VIF
X1	5.67	0.17631
X3	3.33	0.300629
X4	2.57	0.388856
X2	1.57	0.635441
X5	1.05	0.950639
Mean VIF	2.84	

The variance inflation factor (VIF) was employed in testing the data's multicollinearity. This test looks at the extent of the variance inflation. Collinearity or multicollinearity seeks to deduce how perfect a linear combination of a variable is to another variable. In case the VIF value is higher than 10 or incase the tolerance is deduced to be greater than 0.2 then the model has signs of multicollinearity. Tolerance levels are gotten by dividing 1 with the VIF value and the t statistic equation is arrived at by dividing the coefficient by the standard error. In all the occasions, the p value and the T static values must be inverse.

The investigation shows signs of multicollinearity in spite of the fact that they are low levels. The results show that the overall VIF is 2.84 which is less than 10 suggesting that the study information did not show multicollinearity issue as prescribed by (Field, 2009). Hence, all the factors based on the VIF pointers have no serious multicollinearity issue. The removal of multicollinearity from a model also does away with other issues and makes other factors significant. Removal of multicollinearity can be achieved by expanding test measure, change of Factors and removing factors in spite of the fact that expulsion of factors ought to be the final alternative since that variable may be exceptionally imperative to clarify the dependent variable (Field, 2009).

4.3.3 Test for Heteroscedasticity

Table 4.4: Test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for	heteroskedasticity
Ho: Constant variance	
Variables: fitted values of Y	
chi2(1) =	1.41
Prob > chi2 =	0.3623

When heteroscedasticity is detected there is an effect on regression coefficient linearity and un-biasedness. Heteroscedasticity exists if the error term is not the same across the independent variable values. Heteroscedasticity has an impact on the best property of OLS, which results to hypothesis testing conclusions being invalid. The research conducted a Breusch-Pagan test to determine if heteroscedasticity existed (Gujarati, 2004). The null hypothesis is rejected when the chi value is higher than the critical value which means that there is evidence of heteroscedasticity in the model or if the p-value is smaller than 0.05, then we reject the null and hence presence of heteroscedasticity. The outcomes showed that the chi value was 1.41 which showed that there was no evidence of

heteroscedasticity. Additionally, the p value at 0.3623 was higher than 0.05 which meant that the study did not reject the null hypothesis and thus there was no presence of heteroscedasticity in the model.

4.4 Correlations Analysis

Table 4.5: Correlations Analysis

		Operating cost	Automatic Teller Machine	Internet banking	Mobile banking	Bank size	Capital adequacy
Operating cost	Pearson Correlation	1	.516**	.749**	-0.2**	.631**	-.046
	Sig. (2-tailed)		0	0	0.005	0	0.52
	N	195	195	195	195	195	195
Automatic Teller Machine	Pearson Correlation	.516**	1	.560**	.825**	0.766	.005**
	Sig. (2-tailed)	0		0	0	0	0.943
	N	195	195	195	195	195	195
Internet banking	Pearson Correlation	.749**	.560**	1	.351**	.491**	0.055
	Sig. (2-tailed)	0	0		0	0	0.448
	N	195	195	195	195	195	195
Mobile banking	Pearson Correlation	-.2**	.825**	.351**	1**	.608**	.018**
	Sig. (2-tailed)	0.005	0	0		0	0.799
	N	195	195	195	195	195	195
Bank size	Pearson Correlation	.631**	.766**	.491**	.608**	1**	-.126**
	Sig. (2-tailed)	0	0	0	0		0.08
	N	195	195	195	195	195	195
Capital adequacy	Pearson Correlation	-0.046	0.005	0.055	0.018	-0.126	1
	Sig. (2-tailed)	0.52	0.943	0.448	0.799	0.08	
	N	195	195	195	195	195	195

It was noted that the study exhibited a positive correlation coefficient between operating cost and automatic teller machine, as it be seen from the correlation result of 0.516 and the association was considered to statistically significant since the p value was 0 which was less than 0.05. Another finding was the strong positive correlation between internet banking and operating cost as indicated by the value of 0.749, the significant value was 0 which was lower than 0.05 which was considered significant.

The study advanced that there was a strong negative correlation between mobile banking and operating cost as shown by a correlation value of -0.2, the p value was 0.005 which was lower than 0.05 which was considered significant. The study found a positive correlation between bank size and operating cost as shown by correlation coefficient of 0.631, the p value was 0 which was less than 0.05 which was considered significant. Finally, there was a negative correlation between capital adequacy and operating cost as shown by correlation coefficient of -0.046, the p value was 0.52 which was more than 0.05 which was considered insignificant.

4.5 Regression Analysis

4.5.1 Model Summary

Table 4.6: Model Summary

Model	R	R Square	Adjusted R	
			Square	Std. Error of the Estimate
1	.858a	0.736	0.729	0.7742186

R also referred to as the correlation coefficient provided the existing association between the research factors. The outcome revealed that there existed a strong association between the variables of this research as shown by the value of 0.858. The R^2 , which is the

coefficient of determination, showed that 73.6% of the variations within the operating cost were explained by the independent factors.

4.5.2 Analysis of Variance

Table 4.7: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	315.898	5	63.18	105.402	.000
	Residual	113.289	189	0.599		
	Total	429.187	194			

The table showed that the population parameters p significance level was at 0 revealing that the data can be used to make inferences as the p value was less 0.05. The overall model relationship was considered significant since F calculated (105.402) was higher than the F critical (value = 2.26) at 5% level of significance an indication that the dependent variable was significantly affected by the independent variables.

4.5.3 Coefficients

Table 4.8: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	0.024	0.088			0.276	0.783
Automatic Teller Machine	0.016	0.006	0.252		2.834	0.005
Internet banking	3.309	0.281	0.552		11.782	0
Mobile banking	-0.478	0.068	-0.479		-7.024	0
Bank size	0.009	0.001	0.456		7.607	0
Capital adequacy	-0.018	0.059	-0.012		-0.306	0.76

$$Y = 0.024 + 0.016X_1 + 3.309X_2 - 0.478X_3 + 0.009X_4 - 0.018X_5$$

On the regression model it was noted that when all independent variables were held to constant zero operating costs would be at 0.024. One-unit change in the value of automatic teller machine when all other variables are held constant leads to a rise in operating costs by 0.016 units. One-unit change in internet banking when all other variables were constant leads to a rise in operating costs by 3.309 units. One-unit change in mobile banking when all other variables are held constant leads to a decrease in operating costs by 0.478 units. One-unit change in bank size when all other variables are held constant leads to a rise in operating costs by 0.009 units. One-unit change in capital adequacy when all other variables are held constant leads to decrease in operating costs by 0.018 units.

Comparison of the predictor variables on whether they had a significant effect on the model was done by comparing the probability value with $\alpha = 0.005$. When the value was lower than 0.05, the variables were concluded to be significant and vice versa. Automatic teller machine, internet banking, mobile banking and bank size were found to significantly affect the model since their probability values were less than $\alpha = 0.05$ while capital adequacy did not significantly affect the model since the p values was more than $\alpha = 0.05$.

4.6 Discussion of Findings

The findings indicate there was a positive correlation coefficient between operating cost and automatic teller machine as represented by the correlation factor of 0.516 and the association was considered to statistically significant since the p value was 0 which was

less than 0.05. The findings differed with Frenzel (2016) findings that ATMs continue to enjoy acceptability by bank clients because they have the capacity of offering similar services like those of tellers of the bank and therefore cutting down the consumed time in the halls of banking. The findings further differed Tufano (2014) findings that ATMs tend to be a very cost-effective means of generating higher output as they accomplish greater outputs over a specific time period as compared to tellers.

It was deduced that there was a strong positive correlation between internet banking and operating costs as indicated by the value of 0.749, the significant value was 0 which was lower than 0.05 which was considered significant. The findings differed with earlier body of knowledge by Young, Lang and Nolle (2014) that through the internet assistance, banks have the capacity of penetrating the markets of funds having not to be physically present in the markets which in turn reduce the cost of operations. Further internet banking selection results to reduction of expenses and then the likeliness of extending the profitability of banks. Banking through the internet has resulted to remarkable speed in the system of banking, and plays a main part in globalizing the system of banking (Ceylan, Emre & Asli, 2014).

The study advanced that there was a strong negative correlation between mobile banking and operating cost as represented by a correlation value of 0.2, the p value was 0.005 which was lower than 0.05 which was considered significant. The findings supported with the findings by Ndung'u (2015) who pointed out that banking from the mobile service has advanced the business of transferring money and it has resulted to continued automations which have reduced the costs of transaction for the clients and the banks. Further the results of the above study contradicted with the results by Abdul-Hakim, Khan

and Bagudu (2017) who deduced that cost of the services of banking through the mobile did have a positive effect on how Nigeria's Commercial banks performed.

The study found a positive correlation between bank size and operating cost as represented by correlation coefficient of 0.631, the p value was 0 which was less than 0.05 which was considered significant. The findings supported earlier result findings by Hughes and Mester (2016) that larger banks leverage on their size to enjoy economies of scale which in turn reduce their operating cost. These include merits associated with cost savings through dispersion of costs that do not rise in proportion to increase in size. Kolodinsky, Hogarth and Hilgert (2014) also noted that larger banks can rely on their size to strike advantageous financial deals such as cheaper financial resources.

There was a negative correlation between capital adequacy and operating cost as represented by correlation coefficient of -0.046, the p value was 0.52 which was more than 0.05 which was considered insignificant. The results differed from the findings by Themba (2015) that capital adequacy level raises the operating costs levels and also increase as the commercial banks have more money to spend as they increase their operations.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

From the analysis and data collected, the following discussions, conclusion and recommendations were made. The responses were based on the objectives of the study. The researcher had intended to establish the effect of electronic banking on the operating costs of commercial banks in Kenya.

5.2 Summary of Findings

On the descriptive statistics it was noted the value of automatic teller machine recorded a mean average of Ksh 29, 872.43 million with the highest recording at Ksh 219, 971 million and the lowest at Ksh 473 million. The mean average value for internet banking transactions was at Ksh 715.636 million with the highest recording at Ksh 4,357.91 million and the lowest at Ksh 46.72 million. The mean average value for mobile banking transactions was at Ksh 1,124.886 million with the highest recording at Ksh 8,117.68 million and the lowest at Ksh 4.12 million. The mean average value for total assets was at Ksh 96,167.51 million with the highest recording at Ksh 583,213 million and the lowest at Ksh 2,610 million. The mean average value for volume of lending was at Ksh 55,372.36 million with the highest recording at Ksh 411,666 million and the lowest at Ksh 0 million. The mean average value for total operating cost was at Ksh 3,541.123 million with the highest recording at Ksh 21,774.69 million and the lowest at Ksh 55.65 million.

On the correlation analysis it was noted there was a positive correlation coefficient between operating cost and automatic teller machine as indicated by the correlation result of 0.516 and the association was considered to statistically significant. There was a strong positive correlation between internet banking and operating cost as indicated by the value of 0.749. The study advanced that there was a strong negative correlation between mobile banking and operating cost as represented by a correlation value of 0.2. The study found a positive correlation between bank size and operating cost as represented by correlation coefficient of 0.631. Finally, there was a negative correlation between capital adequacy and operating cost as represented by correlation coefficient of -0.046.

On the model summary it was deduced that there existed a strong association between the variables of this research as shown by the value of 0.858. The R^2 , which is the coefficient of determination, showed that 73.6% of the variations within the operating cost were explained by the independent factors. The ANOVA model had a p value of 0.05 which was an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%. The overall model relationship was considered significant since F calculated (105.402) was higher than the F critical (value = 2.26) at 5% level of significance an indication that the dependent variable was significantly affected by the independent variables.

Finally, on the regression model it was noted that when all independent variables were held to constant zero operating costs would be at 0.024. One-unit change in the value of automatic teller machine when all other variables are held constant leads to a rise in operating costs by 0.009 units. One-unit change in internet banking when all other variables were constant leads to a rise in operating costs by 3.309 units. One-unit change

in mobile banking when all other variables are held constant leads to a decrease in operating costs by 0.478 units. One-unit change in bank size when all other variables are held constant leads to a rise in operating costs by 0.009 units. One-unit change in capital adequacy when all other variables are held constant leads to decrease in operating costs by 0.018 units.

5.3 Conclusions

The study concluded that there was a positive correlation coefficient between operating cost and automatic teller machine which was statistically significant. This could be as a result of the cost involved in maintain the ATM however ATM have capacity to offer similar services like those of tellers of the bank and therefore cutting down the consumed time and cost in the halls of banking. The study further concluded that there was a strong positive correlation between internet banking and operating costs. This may be as a result of the cost involved in putting in place systems that prevent internet fraud and cyber-crime. However, through the internet, banks have the capacity of penetrating the markets having not to be physically present in the markets which in turn reduce the cost of operations.

It was concluded that there was a strong negative correlation between mobile banking and operating cost. This is because banking from the mobile service has advanced the business of transferring money and it has resulted to continued automations which have reduced the costs of transaction for the clients and the banks. The study concluded there was a positive correlation between bank size and operating cost, this is because larger banks have high cost of operations compared to the smaller banks. However, larger banks leverage on their size to enjoy economies of scale which in turn reduce their operating

cost. Finally, it was concluded there was a negative correlation between capital adequacy and operating cost. This is because when banks have adequate capital it enables them survive risks such as operational, market and credit risks which in turn reduce their cost of operations.

5.4 Policy Recommendations

Based on the findings the study recommended that there is need for commercial banks to come up with strategies of reducing the cost of maintenance of the ATM but should at the same time increase the number of ATM since ATM enhance efficiency and thus reduce the operational cost involved in running operations in the banks.

There is need for commercial banks to invest in cheaper but efficient systems that prevent and reduce internet fraud and cyber-crime since this may in turn reduce the operational cost of commercial banks.

There is need for commercial banks to enhance the mobile banking platform and also collaborate with the various mobile telecommunications firms in reducing the costs involved in mobile bank transactions since mobile banking is deemed to reduce operational costs of banks.

The commercial banks in Kenya should ensure that they enjoy economies of scale and this can be achieved through merges and acquisitions as this will enhance synergy and which in turn may reduce operational costs of the banks.

The commercial banks in Kenya should ensure that they hold the right amount of capital necessary to facilitate their operations and in turn reduce their operational,

market and credit risks.

5.5 Limitations of the Study

The study was restricted to only 5 years from year 2014 to 2018, a longer term of the study might have captured periods of different financial significance of commercial banks. This may have given a longer time center thus giving a broader measurement to the issues involved.

The study was limited to secondary data collected from the commercial banks in Kenya financial statements. While the data was verifiable since it came from the banks financial statements, it could still be prone to shortcomings.

5.6 Suggestions for Further Study

This study sought to determine the effect of electronic banking on the operating costs of commercial banks in Kenya. Future researches should incorporate other factors affecting operating costs of commercial banks in Kenya. A study can also be done on the factors affecting financial performance and operating costs of different tiers of commercial banks.

The study was constrained to secondary data from verifiable sources. Further investigations ought to be done through primary data. Primary data is precise and diminishes biasness that would otherwise be experienced when utilizing secondary data.

REFERENCES

- Ahmed, N., & Wamugo, L. (2019). Financial innovation and the performance of commercial banks in Kenya, *International Journal of Current Aspects in Finance*, 4 (2), 133- 147.
- Al-Jabir, I. M. (2016). Mobile banking adoption: application of diffusion of innovation theory, *Journal of Electronic Commerce Research*, 13 (4), 2012.
- Allen, F., & Santomero, A. M. (2014). The Theory of Financial Intermediation. *Journal of Banking & Finance*, 21(8), 1461-1485.
- Ang, M. C., Ramayah, T., & Amin, H. (2015). A theory of planned behavior perspective on hiring Malaysians with disabilities. Equality, Diversity and Inclusion: *An International Journal*, 34 (3), 186-200.
- Anjichi, D. A. (2014). Effects of asset and liability management on the financial performance of commercial banks in Kenya. MBA project. Nairobi: University of Nairobi.
- Asare, M., & Sakoe, J. (2015). The effects of electronic banking on financial services in Ghana, *Research Journal of Finance and Accounting*, 6 (16), 147-163.
- Athanasoglou, P., Brissimis, S., & Delis, M. (2016). Bank-specific, industry-specific and Macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, 18 (2), 121-136.
- Bagudu, H., Abdul-Hakim, R., & Khan, S. (2017). Effect of mobile banking on the performance of commercial banks in Nigeria. *International journal of Development Societies*, 1 (2), 70-89.
- Barnes, S. J., & Corbitt, B. (2013). Mobile Banking: Concept and Potential. *International Journal of Mobile Communications*, 1 (3), 273–288.
- Berger, A. N. (2013). The Economic Effects of Technological Progress: Evidence from the Banking Industry, *Journal of Money, Credit and Banking*, 35 (2), 41-76.
- Calomiris, C. W., Heider, F., & Hoerova, M. (2015). A Theory of Bank Liquidity Requirements. *Columbia Business School Research Paper No.* 14-39.

- Casciaro, T., & Piskorski, M. J. (2005). Power Imbalance, Mutual Dependence, and Constraint Absorption: A Closer Look at Resource Dependence Theory. *Administrative Science Quarterly*, 50 (2), 167- 199.
- Central Bank of Kenya (2018). *Economic survey*. Nairobi: Government Printer.
- Ceylan, O., Emre, O., & Asli, D. (2014). The impact of internet-banking on bank profitability- The case of Turkey. Oxford Business & Economics Conference Program ISBN: 978-0-9742114-7-3.
- Cytonn Report, (2019). A report on E-banking innovations available in the Kenyan banking industry.
- Davis, F. (1989). "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, September, pp. 319-40.
- DeYoung, R. (2012). The financial performance of pure play Internet banks. *Economic Perspectives of UK industries*, 25(1), 60-73.
- Erik, M., & Marko, S. (2011). *A Concise Guide to Market Research: The Process, Data, and Methods Using IBM SPSS statistics*, New York: Springer Heidlegerg Dordrecht.
- Frenzel, C. W. (2016). *Information Technology Management*, Cambridge, UK: Thomson Publishing Company.
- Ghodrati, H., & Khah, M. S. (2014). A Study on the Relationship between Electronic Banking and Liquidity Management on Iranian Banks. *Management Science Letters*, 4 (6), 1259-1270.
- Gonzalez, M. E. (2016). An Alternative Approach in Service Quality: An E-Banking Case Study. *Quality Manage Journal*, 2 (2), 78-109.
- Gyabaah, A., Oppong, C., & Baidoo, N. (2015). Electronic Banking in Ghana: A Case of Ghanaian Commercial bank (GCB) Bank Ltd, *European Journal of Business and Management*, 7 (12), 46-71.
- Haggman, S. (2009). Functional actors and perceptions of innovation attributes: influence on innovation adoption", *European Journal of Innovation Management*, 12 (3), 386-407.
- Hillman, A. J., Withers, M. C., & Collins, B. J. (2015). Resource Dependence Theory: A Review. *Journal of Management*, 35(6), 1404-1427.

- Hughes, J., & Mester, L., (2016). Bank Capitalization and Cost: Evidence of Scale Economies in Risk Management and Signaling.” *Review of Economics and Statistics*, 80 (2), 314-325.
- Ikpefan, O. A. (2013). Capital adequacy, management and performance in the Nigerian commercial bank. *African Journal of Business Management*, 7 (30), 2938-2950.
- Kambua, D. B. (2013). *The Effect of Agency Banking on Financial Performance of Commercial Banks in Kenya*. An unpublished MBA project from University of Nairobi.
- Karjaluoto, H., Mattila, M., & Pentto, T. (2012). Factors Underlying Attitude Formation Towards Online Banking in Finland. *International Journal of Bank Marketing*, 20 (6), 261- 272.
- Kenyoru, J. O. (2013). *Effect of Financial Innovations on Financial Deepening in Kenya*. Unpublished MBA project, University of Nairobi.
- Kirk, T. (2015). CARTA & Caribbean Group of Banking Supervisors. IT Workshop for Regional Bank Examiners. *International Journal of Small Business Management*, 4(10), 51-84.
- Kolodinsky, J. K. Hogarth, J. M., & Hilgert, M. A. (2014). The adoption of electronic banking technologies by US consumers. *The International Journal of Bank Marketing*, 22(4), 238-259.
- Kothari, C. R. (2014). *Business research methods*. 6th ed. Boston: Irwin/McGraw Hill.
- Lin, H., Hu, A., & Kang, C. (2015). The effect of electronic banking on the cost efficiency of commercial banks: an empirical study in Asian countries, *Journal of Business and Economics*, 2 (4), 43- 62.
- Maiyo, J (2013). *The Effect of Electronic Banking on Financial Performance of Commercial Banks in Kenya*, Unpublished MBA Project University of Nairobi.
- Mateka, J., Gogo, J., & Omagwa, J. (2016). The effects of E-banking on financial performance of listed commercial banks in Kenya, *American Journal of Finance*, 1 (2), 53-71.
- Mbogo, E. (2017). The influence of automation innovation on the operational performance of Commercial Banks in Kenya, MBA Project United States International University- Africa.

- Mugenda, O., & Mugenda, B. (2012). *Research Methods. Quantitative and Qualitative*. Nairobi: Acts Press Publishers.
- Mwinga, R. (2014). The influence of electronic banking on service delivery satisfaction to customers in the Kenya Commercial Bank, MBA Project, University of Nairobi.
- Nathan, L. (2013). *Community banks are going online*, Community and Banking, Federal Reserve Bank of Boston.
- Ndung'u, N. (2011), Governor Central Bank of Kenya in his speech during the Launch of the Mobile Pay Tangaza E-Commerce and Money Transfer Service on 24th January 2011.
- Njoroge, L., & Mugambi, A. (2018). Effect of electronic banking on financial performance in Kenyan commercial banks, MBA Project, University of Nairobi.
- Okoro, A. S. (2014). Impact of electronic banking instruments on the intermediation efficiency of the Nigerian economy, *International Journal of Accounting Research*, 1 (6), 14-21.
- Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations: A resource dependence perspective*. New York: Harper & Row.
- Phaal, R., Farrukh, C. J., & Probert, D. R. (2015). Technology management process assessment: a case study. *International Journal of Operations & Production Management*, 2 (4), 1116-1132.
- Rai, A., & Allen, L. (2017). Bricks versus clicks: The changing nature of banking in the 21st century. *Journal of Banking and Finance*, 31 (4), 1033–1060.
- Rogers, E. (1983). *Diffusion of Innovations*, The Free Press, New York, NY.
- Tarkka, J. (2015). The Market for Electronic Cash Cards, *Journal of Money, Credit and Banking*, 3 (4), 299-314
- Tufano, P. (2014). Financial Innovation and First-M over Advantages, *Journal of Financial Economics*, 25, 213-240.
- Ugochukwu, P., (2015). *The impacts of electronic banking services on the Ghanaian banking sector - a case study of Ecobank Ghana Limited (EBG)*, Accra, unpublished MBA project from Zenith University College.
- Vekya, S. (2017). The impact of electronic banking on the profitability of the commercial banks in Kenya, MBA Project, University of Nairobi.

- Wright, A., & Ralson, D. (2012). 'The lagging development of Small Business Internet Banking in Australia, *Journal of Small Business Management*, 40 (1), 51-840.
- Yang, S., Zeyun, L., Yaxin, M., & Xingxing, C. (2018). Does electronic banking really improve bank performance? evidence in China, *International Journal of Economics and Finance*, 10 (2), 82-96.
- Young, R. D., Lang, W. W., & Nolle, D. L. (2014). How the Internet affects out-put and performance at community banks. *Journal of Banking & Finance*, 31, (6), 1033–1060.

APPENDICES

Appendix I: List of Commercial Banks in Kenya

1. ABC Bank (Kenya)
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya
6. Chase Bank Kenya
7. Citibank
8. Commercial Bank of Africa
9. Consolidated Bank of Kenya
10. Cooperative Bank of Kenya
11. Credit Bank
12. Development Bank of Kenya
13. Diamond Trust Bank
14. Dubai Islamic Bank
15. Ecobank Kenya
16. Equity Bank
17. Family Bank
18. First Community Bank
19. Guaranty Trust Bank Kenya
20. Guardian Bank
21. Gulf African Bank
22. Habib Bank AG Zurich
23. Housing Finance Company of Kenya
24. I&M Bank
25. Imperial Bank Kenya
26. Jamii Bora Bank
27. Kenya Commercial Bank
28. Mayfair Bank
29. Middle East Bank Kenya
30. National Bank of Kenya
31. NIC Bank
32. Oriental Commercial Bank
33. Paramount Universal Bank
34. Prime Bank
35. SBM Bank Kenya Limited
36. Sidian Bank
37. Spire Bank

38. Stanbic Bank Kenya
39. Standard Chartered Kenya
40. Trans National Bank Kenya
41. United Bank for Africa
42. Victoria Commercial Bank

Appendix II: Automatic Teller Machine

	Bank	2014	2015	2016	2017	2018
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Limited	37,405	136,304	219,971	193,254	201,583
2.	Equity Bank (Kenya) Limited	30,051	115,789	142,160	134,436	165,066
3.	Co-operative Bank of Kenya Limited	38,157	105,158	163,087	148,162	151,197
4.	Barclays Bank of Kenya Limited	30,511	86,052	119,247	94,593	113,661
5.	Standard Chartered Bank Kenya Limited	18,533	80,804	114,331	96,819	96,228
6.	Diamond Trust Bank Kenya Limited	23,128	62,879	98,950	93,388	82,301
7.	I & M Bank Limited	19,056	61,761	85,025	76,058	86,863
8.	Commercial Bank of Africa Limited	18,504	57,237	74,609	68,560	70,076
9.	Citibank N.A Kenya	23,731	52,305	82,127	43,817	75,186
10.	NIC Bank Kenya PLC	10,717	44,820	53,313	62,842	34,199
11.	Stanbic Bank Kenya Limited	14,458	41,543	6,214	71,774	71,306
12.	Bank of Baroda (K) Limited	8,361	27,524	11,475	38,872	37,329
13.	Bank of India	7,640	27,165	10,413	25,245	21,573
14.	Prime Bank Limited	8,344	23,771	6,888	31,137	38,170
15.	Victoria Commercial Bank Limited	16,584	22,067	7,537	12,187	20,126
16.	National Bank of Kenya Limited	7,413	20,289	13,743	15,305	24,504
17.	Habib Bank A.G Zurich	4,639	16,934	6,453	6,172	26,766
18.	HFC Limited	2,133	16,880	6,426	21,636	8,565
19.	Gulf African Bank Limited	4,453	12,204	7,113	9,596	9,457
20.	Guaranty Trust Bank (Kenya) Limited	1,640	9,419	8,053	18,695	12,472
21.	Guardian Bank Limited	2,328	9,125	8,357	5,158	7,780
22.	First Community Bank Limited	2,666	8,120	6,665	3,711	9,131
23.	African Banking Corporation Limited	1,275	6,596	6,016	6,862	5,975
24.	Credit Bank Limited	2,036	6,062	8,140	5,787	4,857
25.	M-Oriental Bank Limited	1,967	5,311	5,421	6,576	7,177
26.	Paramount Bank Limited	2,894	5,299	5,630	3,822	9,283
27.	Development Bank of Kenya Limited	2,288	4,934	6,681	6,363	3,130
28.	Transnational Bank Limited	2,229	4,820	4,465	4,630	5,708
29.	Bank of Africa Kenya Limited	8,397	4,684	7,885	18,389	4,804
30.	UBA Kenya Bank Limited	1,382	4,509	10,508	4,695	2,929
31.	Middle East Bank (K) Limited	1,404	4,240	5,820	2,523	3,750
32.	Mayfair Bank Limited	2,062	3,955	7,961	2,539	5,908
33.	SBM Bank (Kenya) Limited	1,771	3,690	11,999	3,490	6,719
34.	Consolidated Bank of Kenya Limited	10,602	37,536	20,525	24,035	8,291
35.	Sidian Bank Limited	801	3,375	3,238	7,486	2,676
36.	Jamii Bora Bank Limited	473	3,268	3,811	7,501	2,517

37.	DIB Bank Kenya Limited	1,197	3,030	9,751	2,756	1,924
38.	Family Bank Limited	7,434	31,844	21,231	27,460	7,457
39.	Ecobank Kenya Limited	6,041	2,638	6,266	13,983	2,015
	TOTAL	384,708	1,173,942	1,397,509	1,420,312	1,448,657

Appendix III: Internet Banking

	Bank	2014	2015	2016	2017	2018
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Limited	2094.71	1962.30	2637.05	3181.45	4357.91
2.	Equity Bank (Kenya) Limited	2922.32	3119.82	3233.05	2978.01	3267.12
3.	Co-operative Bank of Kenya Limited	2675.90	2892.93	3038.65	2798.94	3070.70
4.	Barclays Bank of Kenya Limited	1529.58	2024.35	2147.92	1978.48	2170.57
5.	Standard Chartered Bank Kenya Limited	1604.01	1744.45	1595.94	1470.04	1612.77
6.	Diamond Trust Bank Kenya Limited	1432.28	1671.54	2157.37	1987.18	2180.11
7.	I & M Bank Limited	1296.88	1513.52	1641.61	1512.11	1658.92
8.	Commercial Bank of Africa Limited	1254.88	1464.52	1552.53	1430.06	1568.91
9.	Citibank N.A Kenya	1215.49	1418.54	1527.34	1406.85	1543.42
10.	NIC Bank Kenya PLC	1272.12	1408.10	1504.45	1385.78	1520.30
11.	Stanbic Bank Kenya Limited	848.87	990.67	1140.82	1050.83	1152.85
12.	Bank of Baroda (K) Limited	675.61	788.48	664.81	612.38	671.83
13.	Bank of India	636.56	742.90	775.04	713.89	783.20
14.	Prime Bank Limited	830.66	566.00	587.39	541.05	593.59
15.	Victoria Commercial Bank Limited	478.67	558.63	657.36	605.50	664.29
16.	National Bank of Kenya Limited	375.98	438.79	485.90	447.57	491.02
17.	Habib Bank A.G Zurich	360.12	420.28	404.04	372.17	408.29
18.	HFC Limited	322.60	376.50	411.16	378.71	415.49
19.	Gulf African Bank Limited	209.45	244.44	208.38	191.95	210.58
20.	Guaranty Trust Bank (Kenya) Limited	184.87	215.75	235.69	217.09	238.19
21.	Guardian Bank Limited	181.07	211.32	226.40	208.53	228.78
22.	First Community Bank Limited	155.19	181.11	187.88	173.07	189.86
23.	African Banking Corporation Limited	152.93	178.49	183.94	169.43	185.89
24.	Credit Bank Limited	149.47	174.44	215.30	198.31	217.58
25.	M-Oriental Bank Limited	134.39	156.84	167.37	154.17	169.12
26.	Paramount Bank Limited	125.48	146.43	108.30	99.76	109.44
27.	Development Bank of Kenya Limited	121.19	141.44	193.59	178.33	195.63
28.	Transnational Bank Limited	118.34	138.11	180.37	166.15	182.28
29.	Bank of Africa Kenya Limited	116.97	136.51	175.36	161.52	177.20

30.	UBA Kenya Bank Limited	115.67	135.00	172.48	158.87	174.30
31.	Middle East Bank (K) Limited	109.41	127.69	130.45	120.16	131.82
32.	Mayfair Bank Limited	105.98	123.68	156.35	144.00	158.00
33.	SBM Bank (Kenya) Limited	86.10	100.48	98.63	90.84	99.67
34.	Consolidated Bank of Kenya Limited	85.53	99.81	110.73	101.99	111.90
35.	Sidian Bank Limited	75.58	88.20	90.29	83.17	91.24
36.	Jamii Bora Bank Limited	65.05	75.92	85.08	78.37	85.98
37.	DIB Bank Kenya Limited	62.10	72.48	57.68	53.14	58.30
38.	Family Bank Limited	49.77	58.09	78.86	72.63	79.70
39.	Ecobank Kenya Limited	46.72	54.52	62.31	57.39	62.96
	TOTAL	24278.48	26963.06	29287.85	27729.88	31289.72

Appendix IV: Mobile Banking

	Bank	2014	2015	2016	2017	2018
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Limited	3,174.49	3,748.69	4,171.21	4,869.63	5,513.52
2.	Equity Bank (Kenya) Limited	4,673.86	5,519.27	6,141.36	7,169.66	8,117.68
3.	Co-operative Bank of Kenya Limited	3,885.04	4,587.77	5,104.86	5,959.62	6,747.64
4.	Barclays Bank of Kenya Limited	1,130.96	1,335.53	1,486.06	1,734.88	1,964.28
5.	Standard Chartered Bank Kenya Limited	1,767.21	2,086.87	2,322.08	2,710.89	3,069.34
6.	Diamond Trust Bank Kenya Limited	456.00	538.48	599.17	699.50	791.99
7.	I & M Bank Limited	1,909.33	2,254.68	2,508.81	2,928.89	3,316.16
8.	Commercial Bank of Africa Limited	4,123.36	4,869.19	5,418.00	6,325.19	7,161.54
9.	Citibank N.A Kenya	52.69	62.22	69.24	80.83	91.52
10.	NIC Bank Kenya PLC	1,790.66	2,114.56	2,352.89	2,746.86	3,110.07
11.	Stanbic Bank Kenya Limited	1,638.52	1,934.90	2,152.98	2,513.48	2,845.82
12.	Bank of Baroda (K) Limited	713.81	842.92	937.93	1,094.97	1,239.76
13.	Bank of India	377.88	446.23	496.53	579.67	656.31
14.	Prime Bank Limited	279.28	329.80	366.97	428.41	485.06
15.	Victoria Commercial Bank Limited	261.20	308.44	343.21	400.67	453.65
16.	National Bank of Kenya Limited	669.59	790.71	879.83	634.12	1,162.96
17.	Habib Bank A.G Zurich	57.78	68.23	75.92	88.63	100.35
18.	HFC Limited	55.52	65.56	72.95	85.16	96.42
19.	Gulf African Bank Limited	35.88	42.37	47.15	55.04	62.32
20.	Guaranty Trust Bank (Kenya) Limited	34.04	40.20	44.73	52.22	59.13
21.	Guardian Bank Limited	32.21	38.03	42.32	49.41	55.94
22.	First Community Bank Limited	313.04	369.66	411.33	480.20	543.70
23.	African Banking Corporation Limited	28.68	33.86	37.68	43.99	49.81
24.	Credit Bank Limited	25.29	29.86	33.23	38.79	43.92
25.	M-Oriental Bank Limited	16.39	19.35	21.53	25.14	28.46
26.	Paramount Bank Limited	41.81	49.38	54.94	64.14	72.62
27.	Development Bank of Kenya Limited	318.97	376.67	419.13	489.30	554.00
28.	Transnational Bank Limited	374.91	442.73	492.63	575.12	651.16
29.	Bank of Africa Kenya Limited	739.52	873.28	971.71	1,134.41	1,284.41
30.	UBA Kenya Bank Limited	143.24	169.15	188.22	219.73	248.79

31.	Middle East Bank (K) Limited	5.79	6.84	7.61	8.88	10.06
32.	Mayfair Bank Limited	41.96	49.54	55.13	64.36	72.87
33.	SBM Bank (Kenya) Limited	51.00	60.22	67.01	78.23	88.57
34.	Consolidated Bank of Kenya Limited	1,474.66	1,741.39	1,937.67	2,262.11	2,561.22
35.	Sidian Bank Limited	89.42	105.59	117.50	137.17	155.31
36.	Jamii Bora Bank Limited	248.91	293.93	327.06	381.82	432.31
37.	DIB Bank Kenya Limited	118.52	139.96	155.73	181.81	205.85
38.	Family Bank Limited	1,323.79	1,563.23	1,739.43	2,030.67	2,299.18
39.	Ecobank Kenya Limited	4.80	5.67	6.31	4.12	8.34
	TOTAL	32,480.00	38,354.99	42,678.02	49,427.72	56,412.03

Appendix V: Total Assets

	Bank	2014	2015	2016	2017	2018
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Limited	376,969	467,741	504,778	555,630	583,213
2.	Equity Bank (Kenya) Limited	277,116	341,329	379,749	406,402	469,357
3.	Co-operative Bank of Kenya Limited	282,689	339,550	349,998	382,830	408,326
4.	Barclays Bank of Kenya Limited	277,116	241,153	250,274	271,682	275,214
5.	Standard Chartered Bank Kenya Limited	226,043	234,131	259,498	285,125	313,217
6.	Diamond Trust Bank Kenya Limited	222,636	147,846	244,124	270,082	273,593
7.	I & M Bank Limited	152,346	198,578	164,116	183,953	186,344
8.	Commercial Bank of Africa Limited	175,809	190,948	210,878	229,525	236,315
9.	Citibank N.A Kenya	141,176	156,762	204,895	98,232	146,215
10.	NIC Bank Kenya PLC	137,087	198,484	103,324	192,817	195,324
11.	Stanbic Bank Kenya Limited	137,299	88,147	161,847	239,408	242,520
12.	Bank of Baroda (K) Limited	122,865	81,190	82,907	96,132	126,316
13.	Bank of India	57,112	65,001	65,338	56,631	57,367
14.	Prime Bank Limited	59,398	68,178	47,815	76,438	77,432
15.	Victoria Commercial Bank Limited	61,813	42,163	68,085	25,985	26,323
16.	National Bank of Kenya Limited	61,945	24,714	22,403	109,942	111,371
17.	Habib Bank A.G Zurich	62,212	20,020	27,156	18,708	18,951
18.	HFC Limited	56,599	29,374	29,619	62,127	74,315
19.	Gulf African Bank Limited	54,918	19,107	69,432	31,316	31,723
20.	Guaranty Trust Bank (Kenya) Limited	60,491	14,440	17,033	27,628	27,987
21.	Guardian Bank Limited	45,934	10,230	16,254	15,803	16,008
22.	First Community Bank Limited	34,370	15,810	12,508	17,360	17,586
23.	African Banking Corporation Limited	32,992	22,058	14,705	24,804	25,126
24.	Credit Bank Limited	28,426	14,609	22,422	14,465	14,653
25.	M-Oriental Bank Limited	19,754	10,533	115,114	10,577	10,715
26.	Paramount Bank Limited	21,439	16,943	10,465	9,541	9,665
27.	Development Bank of Kenya Limited	17,244	10,526	12,202	16,320	16,532
28.	Transnational Bank Limited	15,799	52,427	9,427	10,295	10,429
29.	Bank of Africa Kenya Limited	15,082	14,136	16,418	54,191	64,312
30.	UBA Kenya Bank Limited	16,515	5,678	20,875	6,505	6,590
31.	Middle East Bank (K) Limited	16,954	8,496	5,601	5,121	5,188

32.	Mayfair Bank Limited	13,118	16,782	9,920	3,548	3,594
33.	SBM Bank (Kenya) Limited	16,589	14,613	55,996	11,745	11,898
34.	Consolidated Bank of Kenya Limited	15,278	10,287	14,962	13,456	13,631
35.	Sidian Bank Limited	14,571	15,025	5,234	19,302	19,553
36.	Jamii Bora Bank Limited	15,077	7,781	13,918	12,851	13,031
37.	DIB Bank Kenya Limited	12,147	14,470	15,724	2,610	2,644
38.	Family Bank Limited	10,240	69,280	13,802	69,051	69,949
39.	Ecobank Kenya Limited	9,449	125,295	47,124	53,456	54,151
	TOTAL	3,374,617	3,423,835	3,695,940	3,991,594	4,266,677

Appendix VI: Volume of Lending

	Bank	2014	2015	2016	2017	2018
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Limited	292,237.61	324,284.00	373,031.31	411,666.00	348,945.80
2.	Equity Bank (Kenya) Limited	206,724.83	229,394.00	221,039.00	139,406.00	246,839.41
3.	Co-operative Bank of Kenya Limited	191,690.47	212,711.00	241,395.00	177,224.00	228,887.67
4.	Barclays Bank of Kenya Limited	134,136.74	148,846.00	176,349.00	120,771.00	160,165.74
5.	Standard Chartered Bank Kenya Limited	110,759.28	122,905.00	138,089.50	143,943.00	132,251.93
6.	Diamond Trust Bank Kenya Limited	115,590.50	128,266.00	141,702.00	107,038.00	138,020.63
7.	I & M Bank Limited	93,994.67	104,302.00	104,302.00	139,763.00	112,234.17
8.	Commercial Bank of Africa Limited	97,041.55	107,683.00	105,082.00	221,698.00	115,872.29
9.	Citibank N.A Kenya	41,736.26	46,313.00	68,615.72	68,153.00	49,835.10
10.	NIC Bank Kenya PLC	100,288.49	111,286.00	112,509.00	127,741.00	119,749.30
11.	Stanbic Bank Kenya Limited	93,303.46	103,535.00	118,483.00	128,080.00	111,408.84
12.	Bank of Baroda (K) Limited	33,923.04	37,643.00	5,361.37	5,680.00	40,505.75
13.	Bank of India	5,084.45	5,642.00	4,014.75	3,242.00	6,071.07
14.	Prime Bank Limited	52,245.79	57,975.00	37,480.16	33,589.00	62,384.00
15.	Victoria Commercial Bank Limited	14,296.29	15,864.00	10,317.36	9,882.00	17,070.46
16.	National Bank of Kenya Limited	10,392.38	11,532.00	68,616.00	10,171.00	12,409.01
17.	Habib Bank A.G Zurich	2,514.29	2,790.00	7,026.35	7,365.00	3,002.18
18.	HFC Limited	49,225.95	54,624.00	48,483.10	36,983.00	58,778.16
19.	Gulf African Bank Limited	14,855.92	16,485.00	15,022.00	7,232.00	17,738.68
20.	Guaranty Trust Bank (Kenya) Limited	25,023.01	27,767.00	12,509.00	10,303.00	29,878.68
21.	Guardian Bank Limited	11,558.51	12,826.00	27,392.64	235.00	13,801.42
22.	First Community Bank Limited	11,827.06	13,124.00	0.00	12,330.00	14,122.08
23.	African Banking Corporation Limited	8,945.09	9,926.00	10,497.28	5,443.00	10,680.87
24.	Credit Bank Limited	5,505.52	6,109.25	6,242.85	16,371.00	6,573.86
25.	M-Oriental Bank Limited	11,833.65	13,131.31	13,418.47	18,459.00	14,129.95
26.	Paramount Bank Limited	13,486.64	14,965.56	15,292.83	21,456.00	16,103.69
27.	Development Bank of Kenya Limited	8,469.78	9,398.56	9,604.09	6,867.00	10,113.32
28.	Transnational Bank Limited	3,794.04	4,210.09	4,302.16	6,345.00	4,530.27
29.	Bank of Africa Kenya	8,891.71	9,866.76	10,082.53	9,929.00	10,617.13

	Limited					
30.	UBA Kenya Bank Limited	34,303.23	38,064.88	38,897.28	13,746.00	40,959.71
31.	Middle East Bank (K) Limited	9,114.12	10,113.56	21,038.83	18,887.00	10,882.70
32.	Mayfair Bank Limited	2,423.27	2,689.00	0.00	291.00	2,893.50
33.	SBM Bank (Kenya) Limited	3,290.20	3,651.00	0.00	3,309.00	3,928.66
34.	Consolidated Bank of Kenya Limited	10,342.25	11,476.37	11,925.98	10,710.00	12,349.15
35.	Sidian Bank Limited	2,711.49	3,008.82	3,126.70	6,680.00	3,237.64
36.	Jamii Bora Bank Limited	23,228.53	25,775.74	26,785.56	26,843.00	27,735.99
37.	DIB Bank Kenya Limited	7,214.54	8,005.67	8,319.31	10,995.00	8,614.50
38.	Family Bank Limited	46,382.47	51,468.71	53,485.10	39,560.00	55,382.91
39.	Ecobank Kenya Limited	14,469.96	16,056.72	16,685.77	20,144.00	17,277.83
	TOTAL	1,922,857	2,133,715	2,286,525	2,158,530	2,295,984

Appendix VII: Total Operating Cost

	Bank	2,014	2,015	2,016	2,017	2,018
		Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
1.	KCB Bank Kenya Limited	14,013.64	17,357.89	18,355.48	21,774.69	20,833.66
2.	Equity Bank (Kenya) Limited	9,874.88	13,761.88	11,862.50	16,835.79	17,136.46
3.	Co-operative Bank of Kenya Limited	9,207.47	12,704.66	13,608.76	16,075.50	17,038.33
4.	Barclays Bank of Kenya Limited	9,081.90	11,096.19	9,950.58	10,965.40	11,222.45
5.	Standard Chartered Bank Kenya Limited	7,016.88	10,154.70	9,540.36	10,262.84	10,313.49
6.	Diamond Trust Bank Kenya Limited	6,203.05	7,649.58	8,256.91	9,179.78	10,231.28
7.	I & M Bank Limited	5,392.85	6,401.25	7,094.93	9,272.06	9,427.98
8.	Commercial Bank of Africa Limited	4,635.74	6,412.79	6,225.77	7,803.80	8,623.52
9.	Citibank N.A Kenya	4,563.98	5,770.10	6,853.11	7,452.51	8,004.62
10.	NIC Bank Kenya PLC	4,264.82	5,468.29	4,448.69	6,788.95	5,903.59
11.	Stanbic Bank Kenya Limited	3,340.44	6,551.66	6,864.44	3,479.91	5,510.77
12.	Bank of Baroda (K) Limited	2,507.45	4,964.26	3,223.94	2,355.92	4,690.40
13.	Bank of India	2,468.90	3,544.84	2,455.41	2,361.00	3,235.20
14.	Prime Bank Limited	2,330.48	2,967.81	2,161.23	2,978.68	3,135.62
15.	Victoria Commercial Bank Limited	2,260.41	3,053.42	2,215.39	922.66	3,087.27
16.	National Bank of Kenya Limited	1,629.61	3,115.58	1,146.79	2,410.40	2,402.08
17.	Habib Bank A.G Zurich	1,591.31	3,021.12	991.77	1,686.91	1,669.41
18.	HFC Limited	1,480.03	2,823.80	1,896.06	1,091.69	1,552.47
19.	Gulf African Bank Limited	1,430.82	2,277.38	2,859.96	896.34	1,521.78
20.	Guaranty Trust Bank (Kenya) Limited	1,231.30	2,029.82	671.98	1,991.95	1,431.75
21.	Guardian Bank Limited	1,131.42	1,547.19	697.37	1,342.83	1,229.41
22.	First Community Bank Limited	740.86	1,444.45	556.17	3,959.06	1,014.04
23.	African Banking Corporation Limited	633.95	961.82	502.01	916.77	962.51
24.	Credit Bank Limited	566.56	1,006.66	679.24	382.69	804.75
25.	M-Oriental Bank Limited	564.86	770.77	2,492.12	472.62	801.85
26.	Paramount Bank Limited	532.62	756.79	469.82	750.39	750.90
27.	Development Bank of Kenya Limited	528.25	781.18	557.53	865.57	720.22
28.	Transnational Bank Limited	467.40	891.63	372.59	528.46	667.82

29.	Bank of Africa Kenya Limited	447.52	677.38	657.93	546.90	660.88
30.	UBA Kenya Bank Limited	439.77	532.94	876.87	250.82	625.85
31.	Middle East Bank (K) Limited	423.04	290.52	485.69	299.77	546.53
32.	Mayfair Bank Limited	419.16	196.69	664.28	362.62	468.08
33.	SBM Bank (Kenya) Limited	376.01	226.61	1,907.85	268.77	450.14
34.	Consolidated Bank of Kenya Limited	344.98	109.82	352.88	592.66	407.29
35.	Sidian Bank Limited	336.25	560.03	270.15	81.48	367.35
36.	Jamii Bora Bank Limited	318.55	480.38	317.97	55.65	338.40
37.	DIB Bank Kenya Limited	295.04	401.35	813.63	122.24	330.87
38.	Family Bank Limited	273.22	503.96	411.80	284.83	295.27
39.	Ecobank Kenya Limited	269.58	390.81	1,656.05	429.07	285.71
	TOTAL	103,635.00	143,658.00	135,426.00	149,100.00	158,700.00

Appendix VIII: Total Revenue

Bank	2014	2015	2016	2017	2018
	Ksh Million	Ksh Million	Ksh Million	Ksh Million	Ksh Million
KCB Bank Kenya Limited	54,945	47,229	65,831	57,153	60,624
Equity Bank (Kenya) Limited	47,590	33,280	52,647	54,576	54,524
Co-operative Bank of Kenya Limited	34,018	31,031	41,659	34,306	38,768
Barclays Bank of Kenya Limited	20,627	30,608	29,502	29,433	33,928
Standard Chartered Bank Kenya Limited	19,604	23,648	24,130	21,876	33,329
Diamond Trust Bank Kenya Limited	16,961	20,905	20,515	20,397	21,008
I & M Bank Limited	15,494	18,175	19,995	17,252	20,037
Commercial Bank of Africa Limited	14,820	15,623	17,550	17,198	17,098
Citibank N.A Kenya	13,137	15,381	15,971	15,260	16,486
NIC Bank Kenya PLC	11,701	14,373	13,944	15,180	12,259
Stanbic Bank Kenya Limited	11,542	11,258	13,697	13,595	11,237
Bank of Baroda (K) Limited	10,416	8,451	8,959	7,028	8,952
Bank of India	5,514	8,321	5,399	6,321	7,306
Prime Bank Limited	4,075	7,854	5,050	6,060	7,290
Victoria Commercial Bank Limited	1,750	7,618	3,340	3,583	7,097
National Bank of Kenya Limited	1,525	5,492	1,840	2,664	6,322
Habib Bank A.G Zurich	843	5,363	1,743	1,650	6,230
HFC Limited	810	4,988	1,523	1,333	3,481
Gulf African Bank Limited	524	4,822	1,463	1,268	1,976
Guaranty Trust Bank (Kenya) Limited	497	4,150	1,438	1,243	1,862
Guardian Bank Limited	470	3,813	1,389	1,182	1,743
First Community Bank Limited	445	2,497	1,139	1,168	1,721
African Banking Corporation Limited	418	2,137	698	865	1,667
Credit Bank Limited	369	1,909	513	802	1,442
M-Oriental Bank Limited	239	1,904	374	614	1,280
Paramount Bank Limited	198	1,795	370	434	1,025
Development Bank of Kenya Limited	120	1,780	365	412	865
Transnational Bank Limited	111	1,575	243	470	862
Bank of Africa Kenya Limited	175	1,508	220	363	808
UBA Kenya Bank Limited	153	1,482	143	349	553
Middle East Bank (K) Limited	146	1,426	116	346	518
Mayfair Bank Limited	200	1,413	83	332	371
SBM Bank (Kenya) Limited	126	1,267	129	271	277
Consolidated Bank of Kenya Limited	18,691	6,065	18,123	30,908	28,997
Sidian Bank Limited	1,305	316	233	188	2,397
Jamii Bora Bank Limited	1,571	420	640	132	206
DIB Bank Kenya Limited	1,730	341	1,133	134	182

Family Bank Limited	2,826	921	13,794	107	3226
Ecobank Kenya Limited	2,956	255	2,055	156	743
TOTAL	318,643	351,393	387,955	366,613	418698