THE EFFECT OF ONLINE BANKING ON COST EFFICIENCY IN COMMERCIAL BANKS IN KENYA

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OCTOBER 2013
DECLARATION

I hereby declare that this is my original Research Study work for the award of MBA 2013 and to the best of my knowledge the Study has not been presented elsewhere for the examination purposes.

Signature:............................................................Date: ..................................

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(Reg. No: D61/67981/2011

This Research Project has been submitted for examination with my approval as University of Nairobi Supervisor.

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

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DEDICATION
To the Almighty God, My Parents Paul Mutua, Ann Nduku, Wife Cecilia, Daughter Patience, Son Phinehas, Brothers, Sisters, Supervisor, Students and Lectures.
ACKNOWLEDGEMENTS

I am deeply thankful to Almighty God for granting me breath, strength and determination to surmount the odds that come with a rigorous programme such as the MBA. I would like to express my appreciation to several people who have provided assistance in development of this project. First, my gratitude goes to my supervisor J. Aduda, Moderator Mr. Mirie and lecturers who guided me through the research work.

Second, I express my sincere thanks to the following MBA students Anne Titus, Josephine Nzivu and Jackson for their assistance in research materials and encouragement in preparation of this report.

Third I would like to thank my employer for the support and an opportunity they have granted me in undertaking my project. I acknowledge University of Nairobi Library staff for assistance of relevant project resources. My appreciation to the management of commercial banks in Kenya for availing research data.

Finally, I wish to express my gratitude to my family for their financial, moral support and encouragement may the almighty God bless them abundantly.
ABSTRACT
The banking industry locally and internationally has continued to embrace adoption and implementation of online banking products and services given the discussed benefits that arise, such as lowering operations cost quick and convenient delivery of services to customers and value addition to the banks services this in turn has increased the number of customers and transactions hence higher profits. The role of online banking on efficiency and cost reductions in the banking sector is paramount to the successful and profitable service delivery in the sector. Online banking plays a significant role in improving the efficiency of the banking sector as well as reducing the costs of banking transactions for customers. The banking sector has, for the past decade, witnessed various improvements and new technologies with the main purpose of improving the service delivery of the banking sector. The research objective was to determine the effect of online banking in cost efficiency in commercial banks in Kenya. A quantitative research method was followed and the data was analyzed using chi-square tests.

Empirical analysis has been conducted on a panel data of 7 Kenyan banks and specifically the one using online banking for the period 2008-2012. Accounting data were used to measure the banks' performance and regressed on relevant variables using multiple regressions. The data was then checked for completeness and errors, coded and data entered in SPSS for analysis whereby by quantitative analysis was used and content analysis used on qualitative data. The data was then presented in form of tables, graphs, charts and in prose form for qualitative data. The results show that online banking has a significant positive impact on banks' performance. Online banking has improved the performance of these banks. As a result of adopting online banking, costs associated with adopting online banking are lower than revenues from provision online services. Hence, banks should focus its work to promote the confidence of online banking services and encourage the customers to use this kind of services and make it more secure to avoid unnecessary costs.
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### ABBREVIATIONS AND ACRONYMS

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<td>Automated Teller Machine</td>
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<tr>
<td>CBK</td>
<td>Central Bank of Kenya</td>
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<td>CCK</td>
<td>Communication Commission of Kenya</td>
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<td>CGAP</td>
<td>Consultative Group to Assist the Poor</td>
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<td>EEFFR</td>
<td>Efficiency Ratio</td>
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<td>HCI</td>
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CHAPTER ONE
1.0 INTRODUCTION

1.1 Background of the Study

Internet banking refers to the use of the internet as a delivery channel for banking services, which includes all traditional services such as balance enquiry, printing statement, fund transfer to other accounts, bills payment and new banking services such as electronic bill presentment and payment (Frust, Lang, & Nolle, 2000) without visiting a bank (Mukherjee & Nath, 2003). According to channel (Chau & Lai, 2003), the rapid growth and popularity of the internet has created great opportunities as well as threats to companies in various business sectors, to endorse and deliver their products and services using internet as a distribution channel.

Beside opportunities of this channel, banks and financial institutions across the world face new challenges to the ways they operate, deliver services and compete with each other in the financial sector. Driven by these challenges, banks and financial institutions have implemented services delivery using internet banking (Chan & Lu, 2004). The objectives of launching internet banking include cost reduction, performance improvement, wider coverage, revenue growth, and customer convenience (Bradley & Stewart, 2002; Chau & Lai, 2003). From the customer’s perspective, internet banking facilitates a convenient and effective approach to manage personal finances, as it is accessible 24 hours a day and 365 days in a year without visiting the bank and from any locations (Rotchanakitumunai & Speece, 2003).

The internet changed the way people and companies interact, but the omnipresent mobile Web is revolutionizing those interactions. Online communication is no longer a one-way street where industries broadcast their products to customers who may or may not buy them. As more customers use online and mobile channels, the challenge for a broad range of industries, including banks, is to find clever ways to get in touch with their customers. Consumer behavior is changing partly because of more spare time. The way of use of financial services is characterized by individuality, mobility, independence of place and time, and flexibility.
Financial transactions caused by purchases will more and more be carried out by non- and near-banks (Bailey & Pearson, 1983). These facts represent big challenges for providers of financial services. More and more the Internet is considered to be a "strategic weapon". Financial services companies are using the Internet as a new distribution channel. The goals are: complex products may be offered in an equivalent quality with lower costs to more potential customers; there may be contacts from each place of earth at any time of day or night. This means that financial institutions may enlarge their market area without building new offices or field services, respectively (Beckett, Hewer, & Howcroft, 2000). Because of its image as an innovative corporation, better interacting possibilities, the usage of rationalization potentials, promotion of self-serviced as, the improvement of its competitive situation by development of core competencies together with the construction of market entry barriers, it may be possible to increase profits and market shares (Chin, Diehl, & Norman, 1988).

One way of exploiting rationalization potentials is the implementation of the entire transaction (from purchase to payment) under a common user interface. Information collected in operative databases of financial institutions allows them to act as information brokers. Offering special information in closed user groups may result in more intense customer commitment, as well as customer bonding. Know-how that is built up by Internet presence may be used to facilitate internet presence of smaller companies. The use of digital coin-based money to completely settle transactions in the internet is a new service provided by financial institutions (Chin, & Lee, 2000).

In the recent years there has been explosion of internet based electronic banking applications states that the emergence of new forms of technology has created highly competitive market conditions for bank providers. However, the changed market conditions demand for banks to better understanding of consumers' needs. Success in Internet banking will be achieved with tailored financial products and services that fulfill customer' wants, preferences and quality expectations. Customer satisfaction is a key to success in internet banking and banks will use different media to customize products and services to fit customers' specific needs in the future.
Consumer perceptions of transaction security, transaction accuracy, user friendliness, and network speed are the critical factors for success in Internet banking. From this perspective, Internet banking includes many challenges for human computer interaction (HCI). According to DeVellis (2003) there are at least two major HCI challenges in Internet banking. The first challenge is related to the problem how to increase the number of services of Internet banking and simultaneously guarantee the quality of service for individual customers. The second challenge is related to the problem how to understand customer's needs, translate them into targeted content and present them in a personalized way in usable user interface.

1.1.1 Internet Banking

The concept of electronic banking has been defined in many ways electronic banking is a construct that consists of several distribution channels. Hiltunen, Heng (2004) define electronic banking as the delivery of banks' information and services by banks to customers via different delivery platforms that can be used with different terminal devices such as a personal computer and a mobile phone with browser or desktop software, telephone or digital television.

Online banking (or Internet banking or e-banking) allows customers to conduct financial transactions on a secure website operated by the institution. To access a financial institution's online banking facility, a customer having personal Internet access must register with the bank for the service. Customer numbers are normally not the same as account numbers, because a number of accounts can be linked to the one customer number. The customer will link to the customer number any of those accounts which the customer controls, which may be cheque, savings, loan, credit card and other accounts. Customer numbers will also not be the same as any debit or credit card issued by the financial institution to the customer.

Online banking facilities offered by various financial institutions have many features and capabilities in common, but also have some that are application specific. A bank customer can perform some non-transactional tasks through online banking, including viewing account balances, viewing recent transactions, downloading bank
statements, for example in PDF format, viewing images of paid cheques, ordering cheque books, download periodic account statements, Downloading applications for M-banking. Some online banking platforms support account aggregation to allow the customers to monitor all of their accounts in one place whether they are with their main bank or with other institutions. All the above have reduced cost of operation as the clients serve themselves and staff cost is highly reduced. According to Aduda and Kingoo(2012) in their journal electronic banking said that electronic banking has made banking transaction to be easier by bringing services closer to its customers hence improving banking industry performance.

Banks are one of the most significance institutions in Kenyan finance system. For the last few years many banks large and small have adopted internet banking/ online banking as a new channel of service delivery. Online banking is a financed innovation important to banks Frame and White (2004) and it is of higher importance to know whether they have impact on cost incurred by banks on daily operations of the bank. We examine whether banks in Kenya have already adopted online banking have experienced any performance cost improvers. Return on equity (ROE) and efficiency ratio (EEFFR).

One reason for adopting online banking is to help banks to reduce their operating expenses as compared to in person banking De young, Lang and Nolle (2007), Hernandez Murilloa,llobet and Feuentes (2010), The adoption of online banking may benefit adopting banks in terms of greater customers satisfaction and loyalty. As such innovation may not always have the anticipated outcome on organizational performance and whether internet banking adoption improves bank performance remain as empirical question.

Some Banks may adopt online banking to differentiate themselves from competitors. This product differentiation strategy may (may not) have result in competitive advantage, depending on consumers’ attitudes towards the new innovation –online banking. Moreover there are significant risks and burdens to earlier adoption, as technologies and security issues may not have been fully resolved. Consumer concerned over these issues may have worked against adopting banks. The
opposite applies to later adopters: later adopts can enjoy more sophisticated and well established technologies and at lower costs and well established online banking and at lower costs but they will no longer be able to claim product differentiation. The role of technology in banking relations has attracted increasing attention in recent years for instance, Petersen and Rajan (2002) showed that the distance between borrowers and banks is increasing.

The purpose that ‘Technology is slowly breaking the tyranny of distance’ (P.2535). Internet banking is exactly an example of such technological econometric evaluations of whether such technological advances uniformly bring about performance improvements. Given these cross currents, the purpose of this project is to answer two questions about commercial Banks’ adoption of online banking: ‘Is internet banking associated with any improvements in performance in terms of cost and what factors in adoption process are associated with any improvements increases in cost performance e.g. operational efficiencies Cornet Ors and Tehranian (2002).

My goal is to econometrically estimate the cost associated with online banking among commercial bank. Industry analysis outlining the potential impact of internet banking on cost saving, revenue growth and risk profile of the banks have also generated considerable interest and speculation about the impact of the internet on the banking industry Berger (2003). Online banking has been adopted for achieving higher efficiency control of operations and reduction of cost by replacing paper based and labour intensive methods with automated process thus leading to higher productivity and profitability.

1.2 Problem Statement
The Promotion of online banking technology enabled the banks to enhance its operations with cost cutting effectively and efficiently in order to handle daily banking affairs via online banking channel. Customers are being facilitated by reducing their visits in banks and they can carry out their transactions via internet or ATM Machines and PDQ machines instead of personally visiting the branches,
Aduda, Kingoo (2012). Banks boost technology investment spending strongly to address revenue, cost and competitiveness concerns. For some activities, banks hope to see a near-term impact on profitability. Other investments are motivated more by a desire to establish a competitive position or avoid falling behind the competition. The big question is whether there is comparative cost advantage by financial institutions which have adopted internet from those who have not. Since 2008 KCB Bank group introduced a new IT system T24 from the previous TC3 system. The new system was a platform to support other internet banking such as Mobile Banking, Internet banking, Agency banking and ATM online services through introduction of VISA ATMs. Other Banks among them Cooperative ban, Equity Bank, Barclays Bank, Standard chartered, and last to adopt a new system National Bank, all this was done to facilitate smooth facilitation of online banking among other function. The main aim was to reduce cost of operation and increase Revenue.

Despite the above observation, there is almost no study available that tries to systematically explain the effect of online banking and cost efficiency in commercial banks in Kenya. Studies have been carried out to examine the general effects of internet banking on bank performance, but, no studies have specifically addressed the issues regarding the cost effectiveness that arises from using internet banking services. The purpose of the present study is to analyze such effects of Internet banking on the cost effectiveness in business within the Kenya Commercial Bank. Korir (2010) studied on factors influencing mobile banking in KCB at Garissa. His study was narrowed to semi arid areas and the scope too general hence little focus on cost efficiency hence did not tackle the effect of online banking and cost efficiency. Cheruiyot (2010) in her study factors that affect the adoption of new products in Kenya commercial banks in Kenya She tackled on cost but failed to relate its efficiency in banking operations.

Studies on electronic banking which emphased on plastic money i.e cards ATMs Aduda, Kingoo (2012) studied relationship between electronic banking and financial performance among commercial banks in Kenya, The study focused on general performance but ignored aspect of cost efficiency, The study concluded that there exist a positive relationship between e-banking and bank performance. Shalakha (2012) did study on relationship between financial innovation and growth of
commercial banks in Kenya, He concluded that there was positive relationship between the two variables but the study was limited on general performance only. Wihenya, Bwengi, Ngigi and Maina (2012) narrowed their study on effect of agency banking and mobile banking which are channels of online banking but their focus was adoption of this channels and their effect on general performance.

1.3 Objectives of the Study

1.3.1 General Objectives of the Study
The purpose of the study is to find out the effect of online banking on cost efficiency in commercial banks in Kenya.

1.3.2 Specific Objectives
So as to achieve the general objective highlighted above the study will address the following specific objective:

i. To determine the effects of the adoption of online banking on operational cost in commercial banks in Kenya.

ii. To determine the effects of the adoption of online banking on labour cost in commercial banks in Kenya.

1.4 Significance of the Study
The study will enable unearthing profits issues of online banking by understanding costs factors, operations efficiency and other factors of performance e-banking. Many financial institutions in Kenya (KCB, Equity bank, Barclays bank and Cooperative bank) have turned to branchless banking methods such as online banking in their efforts to increase their competitive advantage over their rivals. Online banking in Kenya is in the early stages as it has been there since 2010 and with a limited number of provides that are operational. Despite the fact that online banking is in existence, the service has not yet been exploited fully and this demands attention. This therefore justifies the relevance of this study in providing guidance in online banking.
This study will enhance the understanding of cost factors associated with the adoption of online banking in commercial banks in Kenya. The study will inform Kenyan banks on the actual contribution of online banking to their cost efficiency.

1.4.1 Benefits to Commercial Banks in Kenya

This study will inform Kenyan banks on the actual contribution of online banking to their cost efficiency and/or non performance with a view of sustaining the gains thus made and addressing any weaknesses that may be observed. The banks will also be able to lobby for appropriate policy formulation and strategies that will fully exploit online banking opportunities that are feasible in Kenya.

The information gathered will encourage financial institutions to use online banking in the provision of banking services so as to reduce the cost of financial services and to foster financial inclusion, reach and depth.

1.4.2 The Government

The study will inform the central bank of Kenya on the areas in the guidelines that require to be reviewed. In addition the central bank of Kenya bank supervisors will be informed on areas of focus during the audit based on the risks. It will also increase financial outreach and to promote financial inclusion to the unbanked and under banked population. Hence, helping the Government to move towards achieving the financial pillar, one of the vision 2030 pillars.

1.4.3 Further Research

Other researchers and academicians can use the results of the study for training and further research, as the study will lay platform on which research on the topic can be undertaken. It will highlight information available currently, expected changes in the market and the possibility of more research as the mutual fund market grows in Kenya.
2.1 Introduction

This chapter will present the literature review on the effects of online banking on the performance of banks in Kenya. It will summarize the information from other researchers who have studied the field. The review has covered both the theoretical and empirical reviews of the existing literature. The theoretical review helps in understanding of the current body of knowledge on the research topic while the empirical review help in understanding what other related studies have found and suggested. The reviews will be used to develop conceptual frame work.

Online banking intensity is specified as a term constructs INTERNET and estimated using web feature data collected from bank websites. An empirical function of a nonstandard Fourier flexible form is estimated using bank's financial data to derive a theoretically consistent performance measure. The actual impact of online banking on performance is measured by regressing the ROA and ROE variables against a number of correlates including online banking intensity measure. Using univariate analysis, the results indicates that Internet banks are larger banks and have better operating efficiency ratios and profitability as compared to non-Internet banks.

Internet banks rely more heavily on core deposits for funding than non-Internet banks do. However, the multiple regression results reveal that the profitability and offering of Internet banking does have a small significant association(less than 5%), larger significant and negative association with risk profile of the banks(more than 10%) meaning that internet based banks become better off from risks such as the non performing loans. However, the advantage expected of internet banking is yet to show some significant positive financial gains but begs for future investigation beyond financial measures used in the study as technology continues to penetrate the market.

The increased adoption and infiltration of the Internet has recently redefined the playground for retail banks. Retail banks are now offering their services primarily through their Internet banking branches. The repercussions of this change to “brick and mortar” banks have been studied in the context of developed market economies.
In this paper, we contribute to the literature by studying the impact of Internet banking adoption on banks’ deposit collection, lending activities, and performance in an emerging market setting. By using a panel of 18 retail banks that operate in Turkey from 1990-2008, we demonstrate that Internet banking adoption has a positive impact on the level of profits, deposits and loans per branch. As operational activities are now provided via internet branches, internet banking facilitates banking activities in branches that require more human input. We also find that internet banking adoption has a negative impact on bank profitability after 2 years of adoption as internet banking increases competition and results in lower interest income. Accordingly, internet banking complements brick and mortar branches.

Financial industry is a heart of every robust economy, if it collapses so will the economy and it is absolutely evident from current recession in UK, and in turn, Information Technology has become the heart of banking sector. Investment and reliance in e-banking innovation by its providers to offer their services makes it essential to understand how various aspects of consumer behaviour affect the innovation and respond to service quality. Within this context this paper has undergone a critical literature review of previous researchers with an objective to examine the impact of e-banking on consumer’s behaviour to e-service quality. To further this, since increased adoption of internet as a delivery channel contributes a gradual reduction in overhead expenses (Marketing, IT and Staff), this paper also consists of a critical review of peer reviewed, scholarly and organizational literature regarding the impact of e-banking on banks’ performance to examine if banks have successfully achieved customer’s satisfaction, by providing high level of quality service through online delivery channel, besides operating cost minimization and revenue maximization.

2.2 Theoretical Review

In earlier time Greenbaum and Haywood (1973) reviewed the history of American financial market and argued that the growth of wealth is the determinant of demand of financial innovation. In other words, the fast development of economy caused financial innovation motive, including constraint-induced financial innovation theory
of Silber, Circumvention innovation theory of Kane, regulation innovation theory of Scylla, transaction cost innovation theory of Hicks and Niehans. Cost saving and accessibility of financial services are the main forces driving banks to embrace online banking in their operations.

This chapter will present the literature review on the effects of online banking on the performance of banks in Kenya. It will summarize the information from other researchers who have studied the field. The review has covered both the theoretical and empirical reviews of the existing literature. The theoretical review helps in understanding of the current body of knowledge on the research topic while the empirical review help in understanding what other related studies have found and suggested. The reviews will be used to develop conceptual frame work.

2.2.1 Porter Theory of Competitive Advantage

Michael Porter (1985) proposed theory, competitive advantage theory that states that businesses should pursue policies that create high quality goods to sell at high prices in the market. Porter emphasizes productivity growth as the focus of national strategies (Porter, 2004). Competitive advantage stresses on maximizing economies of scales in goods and services that garner premium prices. Competitive advantage occurs when an organization acquires or develops an attribute or combination of attributes that allows it to outperform its competitors. These attributes can include access to natural resources, such as high grade over or inexpensive powers, or access to highly trained and skilled personnel human resource.

On that note therefore, banks in Kenya have employed the use of agent banking.

The banking industry in Kenya has been characterized by stiff competition between the banks with each competing for market leadership. It is advantageous for any bank when it is a market leader because it has significant financial and perpetual benefits which then lead to consistently and focus on quality; it also enhances the use of the full range of banking tools to solidify performance and leads to ownership of core benefits with a balance of national and economic massages. (Aryeetey & Cludry 1998).
The secret of gaining competitive advantage among the banking service provider is by building themselves as brand and target to retain brand loyalty and enhance brand presence where it is limited and this has been achieved by the use of online banking in the unbanked locations in Kenya. Branding helps banks to distinguish and differentiate themselves from competitors (Miller, 2003). Brand loyalty gives the brand stability of future sales and less costly to retain it.

2.2.2 Advanced Constraint – Induced Financial Innovation Theory

American economist (Silber, 1983) under this theory pointed out that the purpose of profit maximization of financial institution is the key reason of financial innovation. This will be possible through minimization of costs. There are some restrictions (including external handicaps such as policy and internal handicaps such as organizational management) in the process of pursuing profit maximization. Though these restrictions not only guarantee the stability of management, they reduce efficiency of financial institution, so financial institutions strive toward casting them off. Constraint- induced innovation theory discussed the financial innovation from microeconomics.

2.2.3 Innovation Theory

The world is witnessing today profound transformations and acceleration as a result of the tremendous development of information technology and the steady growth of volume of information, which has led to the emergence of new types of transactions and activities in various fields (Joseph et al 2005). The banking sector has been one of the first sections that have adopted many electronic applications to improve performance and gain a competitive advantage strategy. In light of the extensive use of information and communication technologies, the financial services industry and banking has provided new systems and applications that maximizes the use of modern technology and are now available. Therefore it has become necessary for banks to change the concept of traditional banking service to remote banking services because of the rapid growth of electronic banking services by customers and increased competition among banks to reduce costs, raise efficiency and attract more customers.
Hence the bank agents have thrived and are currently estimated to have 33% penetration.

The number of banks opening branches has decreased and is attributed to affordable agent banking and lowers service charges (Makori, 2003). Innovation in banking should be directed to at improving the infrastructure that fosters efficient financial services and international trade. In this study, innovation theory will be used to show how modern payment systems have transformed the technology of banking and facilitated charges in the strategy and structure of financial services organizations. Design, implementation and dissemination of payments systems and costs have come down according to bank case studies, Michael and Bloodgood( 2010). Currently agent banking is an integral part of modern banking in many countries and the market is still growing.

2.2.4 Circumvention Innovation Theory

Kane (1981) An American economist thinks that many forms of government regulations and controls, which has the same property of implicit taxation, embarrass the profitable activity engaged by the company and the opportunity of earning profit, so the market innovation and regulation innovation should be regarded as the continuous fighting process between independent economic force and political force. Financial institutions deal with the status such as the reduction of profit and the failure and the failure of management induced by government regulations in order to reduce the potential loss to the minimum.

Therefore, financial innovation is mostly induced by the purpose of earning profit and circumventing government regulations. It comes true through the game between government and microcosmic economy unity. Kane’s theory is different from the reality. The regulation innovation He assumed is always towards the direction of liberal markets innovation, the result of the game is release of financial regulation and market become more liberal. But his theory is better than constraint- induced financial innovation theory. It not only considered the origin of innovation in the market but also researched the process of regulation innovation and their dynamic relation.
2.3 Empirical Review

In Kenya, there are forty-three banks and nine non-bank financial institutions (Mortgage financials companies and market brokers). Fifteen micro finance institutions and forty-eight foreign exchange bureaus. Thirty five of the banks, most of which are small to medium sized, are locally owned. The industry is dominated by a few large banks most of which are foreign owned though partly locally owned. Ten banks are listed on the Nairobi securities exchange. The banks have come together under Kenya bankers association (KBA), which serves as a lobby for the banks’ interests and addresses issues affecting member institutions. The commercial banks and non-banking financial institutions offer corporate and retail banking services but a small number, mainly comprises the large banks, offer other services including investment banking. According to central bank of Kenya data, in the year 2011, the banks made a pre-tax profit of Kshs 80 billion, beating the ksh74.2 billion recorded in 2010(CBK,2011)

For the last one decade, the baking environment in Kenya has been very dynamic. There has been a shift from stable, non – volatile and predictable business environment to one which is quite volatile, unpredictable and competitive .Up to the late 1990s, many banks in Kenya enjoyed unchallenged monopolies and government protection (Kaskende, 2008).

Globalization has spearheaded the integration of the Kenya economy with other world class economies such as Singapore, which is now part of the global village. The powers of information and technology, de-regulation, globalization of markets and stiff competition has made banks better educated, more inquisitive, sophisticated and deciding. The banking environment has changed tremendously thereby posing serious implications and challenges to the survival and profitability of banks (CGAP, 2003).

However, according to (FSAK2009) the Kenyan banking sector has demonstrated a solid growth over the past few years. The industry continues to offer significant profit opportunities for the major participants. Banks generally earn their revenues from taking in funds and lending them out at a higher rate. The spread between deposits and loans has continues to be around 8.5% offering much profit potential. Profit after
tax of the overall banking system increased by 38.61%, or Kshs 5.08 billion, from 13.15 billion in December 2005 to Kshs.18.22 billion December 2006. This growth is a continuation of the strong growth in profit after tax that the industry has achieved for the past several years.

The increase in profit reflected an increase in interest income on loans and advances, which rose by 14.36% or Kshs 5.51 billion to Kshs 43.9 billion in December 2006 from Kshs 38.39 billion in December 2005. The increase in interest income was due to the growth of 16% in loans given out. The rate on loans in the industry has been stable at an average of 11% (CGAP, 2006).

2.3.1 Agency Banking

Bank agents help financial institutions to divert existing customer from crowded branches providing a “complementary” often more convenient channel of accessing bank services. Financial institutions in developing markets reach an “additional “client segment or geography. Reaching poor clients in rural areas is often prohibitively expensive for financial institutions since transaction numbers and volumes do not cover the cost of a branch. (Kitaka P.2001). In such environments banking agents that piggy bank on existing retail infrastructure and lower set up and running cost can play a vital role in offering many low income people their first time access to a range of financial services. Also low income clients often feel more comfortable banking at their local store than walking into a mobile branch (Adiera, A-1995).

Brazil is a pioneer in agent banking. Since 1999, more than 100,000 retail outlets have been turned into bank agents, reaching 13 million extra unbanked people. In Brazil, bill payments and the payments of government benefits to individuals comprised 78% of the 1.53 billion transactions conducted at the country’s more than 95,000 agency’s in 2006(CGAP 2006).

In Russia, more than 100,000 automated payment terminals have sprung up in the larger cities in the recent year. One provider, cyber plat, claims to have processed 1.2 billion transactions worth US$4.7 billion through the first three quarter of 2007. Via its 70,000 cash acceptance points, mostly for prepaid airtime, television, internet and other utilities (CGAP).
The research study also found out the average mobile banking customer of WIZZIT (a mobile phone banking provider in South Africa) bought airtime with WIZZIT twice as often (2.6 times) as they withdrew funds from a branch or ATM (1.3 times) and five times as often as they made a money transfer (0.5 times) (Ivantury and Pickens 2006).

So far in Kenya, Equity bank (Equity Mashinani) post bank (Benki yangu), Cooperative bank (Coop Kwa jirani) and Kenya commercial bank (KCB mtaani) have launched forays into the segment.

Recent data from the central bank of Kenya reveals that the regulator has licensed over 10,000 establishments to act as agents of banks with Equity bank claiming to have outsourced some of its operations to 5,000 active outlets. CBK data shows 8,809 agency outlets were opened in 2010, most of which are being operated by Equity and cooperative bank. KCB hoped to open about 2,500 agency branches by 2012, while post bank hoped to open 500 agency branches by 2012.

That poor people are not usefully early adopter of technology can be explained by personal experiences as well as the fact that they are less attractive to providers. This makes the job of governments and donors who are targeting unreached people with financial services much harder. Government programs in India, Russia, Malawi, South Africa and Brazil distribute social protection payments to customers through branchless banking channels. These have been found successful at opening bank accounts for millions of unreached customers in some cases (notably Brazil), but have not led to regular use of those accounts to spread expenditure overtime - balance tend to be withdrawn in full as soon as payments and received. More research is needed on how poor and excluded clients view their relationship with banking agencies and their willingness to trust providers. (Lyman, Ivantury, and staschem, 2006).

Financial service providers view agency networks as key to achieving their business strategy.

Most financial service providers see partnership with businesses that have a substantial local retail presence as a key to competitive strategy. They act to build their networks as quickly as they can to expand the pool of potential customers and attain local branch presence. (Mass and Siedek, 2009) argue that depending on
regulations, agents can be use to open new accounts (Sign up customers and conducting customer due diligence), or to conduct customers’ cash transactions (to deposit into and withdraw from an account or to make or receive payments). Given the findings that most branchless banking customers do not build sizable deposit balances, most customer transactions do not in fact entail a cash transaction. Many banks that want to enter into branchless banking have partnered with businesses that have many local outlets so that they can jump-start the agency networks, including mobile operators, post office, and major retail chains.

2.3.2 Branchless Banking Regulation

Experience to date suggests that branchless banking models can play a part in delivering better, safer and more reliable services than those usually available to the unreached. Some regulators may perceive that financial service delivering through branchless channels and non bank provider is higher risk than traditional banking. Portfolios of the poor by (Collins et al, 2009) documents how poor people struggle to manage their financial lives given the lack of services suitable to their tiny, highly viable and uncertain income. In the M-pesa case in Kenya, an innovative business model emerged and scaled rapidly in a safe manner in the absence of an elaborate consumer protection framework. This challenges the perception of risk and promise that substantial consumer protection rules are a precondition for healthy development of branchless banking.

The Kenyan case suggests that there can be providers that have their own (non regulatory) incentives – such as reputation and the need to build trust in the market for a new service to act responsibly. M-pesa and other service providers have offered transparently and adopted safeguards to protect consumers, including those with little or no prior experience with formal providers (Danielle, 2008). (Lyman and Stschem, 2006) indicate that protecting client funds is priority for many financial regulators, as loss of funds can have serious consequences for customers, as well as for public confidence in financial systems. Banks are usually required to comply with prudential rules created to ensure systematic stability and depositor protection. Bank deposits also are covered by insurance in many jurisdictions. In addition, governments may provide an implicit guarantee to bank depositors, especially when banks are
systematically important. However, in emerging branchless banking models, nonbanks may collect funds in exchange for electronically stored value, without being subject to the full range of prudential rules imposed on banks. Also, there may be models where even if client funds sit in a bank account, they receive a different regulatory treatment than those applicable to bank deposits.

Countries with the most prominent branchless banking models have taken varied approaches to handling and protecting client’s funds. In the Philippines, smart money accounts balances are deposited in the clients name in a commercial bank but are considered accounts payable on the bank’s books rather than deposits. Hence, although it is a bank based model, it has different regulatory treatment as to bank deposits. In Russia, web based stored value services do not currently follow any regulatory standard for safeguarding client funds. Funds collected by M-pesa, which customers increasingly use as a short-term savings mechanism (Collins 2010), are deposited in pooled trust accounts at the several commercial banks, for the benefit of the customers no system is in place for customers to claim trust assets (e.g. in the event of insolvency).

In Kenya policy and regulation have been used extensively to support the development of a diverse range of delivery channels. In 2006, the CBK and CCK and the Ministry of Finance supported the rollout of Safaricom’s mobile phone base money transfer product M-pesa, through Safaricom as the implementing agency and not a commercial bank. In 2009 the finance Act was amended to facilitate use of third parties by banks to provide banking services. Central bank’s Agent banking guidelines (CBKK/PG/15) issued in 2010(central bank website) to regulate agency banking.

2.3.3 The Effects of the Adoption of Electronic Banking on Operational Cost
Despite the potential benefits of ICT and e-commerce, there is debate about whether and how their adoption improves bank performance. Several attempts Josiah Aduda and Nancy Kingoo have been made to investigate the impact of electronic banking on bank performance. Studies by Kariuki (2005) showed the positive impacts of ICT on their banking performance using bank turnover and profits as measure of
performance. He established that banks those with high profit growth are more likely to be using greater numbers of advanced ICTs. He concluded that e-banking leads to higher profits though in long-term but not in short-term due to high ICT investment cost. All this studies used profit and turnover as measures of bank performance. While Davenport (2003) and Oshikoya (2007) and Jean-Azam (2006) suggest that use of and investment in ICT requires complementary investments in skills, organization and innovation and investment and change entails risks and costs which might reduce bank profits in shorter. Hence there is need to use some of relative measure such as return on assets to uncover the impact of ICT investment on banking performance. This was gap being addressed in this study.

Banks are focusing increasingly on their e-banking activities, and are globally expanding electronic banking activities exploring the use of wireless networks and venturing into some new areas of electronic commerce. Banks offer e-banking services to defend or expand market share or as a cost saving strategy to reduce paperwork and personnel. The internet also provides banks with sustainable opportunity to extend their customer reach beyond existing boundaries.

One of the most important revolutions “lived” by the banking sector has been set off by the new informational and communication technologies, “under the guidance” of the Internet. Under the impact of new technologies, new types of banking services rose. The financial markets became more fluid and more efficient, and the consumers were able to choose from a number of offers that often also come from other organizations than the banking ones (Octavian and Daniela, 2004). The official start of this applied technology on the banking sector was in 1995, which witnessed the first electronic bank (Siam, 2006). E-banking offers the convenience of conducting most of the banking transactions at a time that suits the customer. The customer can access funds and transfer funds between accounts, pay bills and make purchases 24 hours a day, 7 days a week.

Internet is used as a strategic and differentiating channel to offer high valued financial services complex products at same or improved quality at lower costs without physical boundaries and to cross sell products like credit cards and loans. Apart from the poorly developed systems and structures, the developing countries may benefit
from the technologies offered by today’s world while building up their financial intermediation infrastructure. These technologies are provided through electronic banking.

Allen et al (2002) gave the definition of e-finance as “the provision of financial services and markets using electronic communication and computation”. The use of electronic communication in finance has the history further back than 1970s. Earlier, the payments between the banks resolved electronically over the telegraph. However, for payments let it be large or small are done effectively and efficiently over the electronic communication mechanisms. Boundaries between different financial institutions have been removed, due to electronic means for transactions the services and the product are now offered with more efficiency and quality.

The most significant policy issue is regarding providing an environment facilitating e-finance, providing regulatory and other reformatory frameworks for enforcing contracts, privacy, information communication, security, telecommunications and infrastructure for e-transactions. E-finance can benefit financial sector development of emerging countries by lowering costs, increasing the breadth and quality and widening access to financial services. Birch and Young (1997) analyzed the consumer side for e-banking and the results showed that consumers basically seek for transactional efficiency, choice for core and non-core banking products and access to competitive prices and returns.

Onay et al (2008) in their research on Turkish banks concluded that e-banking has a positive impact on the profits of banks. According to their study, “Internet has changed the dimensions of competition in the retail banking sector. It has also provided opportunities for emerging countries to build up their financial intermediation infrastructure. Investment in e-banking is a gradual process. The internet banking variable has had a positive effect on the performance of the banking system in Turkey.” Also, Siam, 2006) examined the impact of e-banking on Jordanian banks and concluded that majority of the banks are providing services on internet through their websites and his findings show that the attention is more to achieving e-banking as satisfying and fulfilling customers’ needs. He also concluded that there should be a well articulated strategy to achieve success and profits in the long run.
In their research, De Young et al (2007) analyzed the effect of e-banking on the performance of banks by studying US community banks markets and compared the performance of virtual click and mortar banks with brick and mortar banks. Their findings concluded that e-banking improved the profitability of banks hence increasing their revenues. Also, E-banking is largely driven by the factors of minimizing the operating costs and maximizing operating profit, suggests Simpson (2002). According to Centeno (2004), the e-banking adoption factors are divided into two categories: 1). Factors relating to the infrastructure and accessing technology; 2). Factors that are related to retail banking factors. The prior factors include skills on the part of consumers in using internet and other related technologies, attitudes towards technologies, internet penetration rate, privacy and security concerns. Later involves factors like banking culture, e-banking culture, trust in banking institutions and internet banking push.

2.3.4 The Effects of the Adoption of Electronic Banking on Labour Cost

Improving customer service, increasing market reach and reducing costs are now basic expectations of Internet banking services. If consumers are to use new technologies, the technologies must be reasonably priced relative to alternatives. Otherwise, the acceptance of the new technology may not be viable from the standpoint of the consumer (Al-Sukhar, 2005). Internet banking model offers advantages for both banks and customers. The Internet provides the banks with the ability to deliver products and services to customers at a cost that is lower than any existing mode of delivery. Another factor that would stand in the way of consumer adoption of e-banking is the cost factor.

Hernando and Nieto (2007) attempted to fill this gap by identifying and estimating the impact of the adoption of a transactional web site on financial performance using a sample of 72 commercial banks operating in Spain over the period 1994-2002. The analysis of the sample is based on several financial performance ratios. These financial ratios measure business activity as a percentage of total assets (loans, deposits, off-balance sheet and trading portfolio activity); operational performance as
a percentage of average total assets (general expenses and more specifically staff, information technology and marketing costs) and profitability (return on equity – ROE–, return on assets –ROA–, intermediation margin, other income and securities brokerage commissions). The results showed the adoption of the Internet as a delivery channel involves a gradual reduction in overhead expenses. The cost reduction translates into an improvement in banks’ profitability.

2.3.5 The Effects of the Adoption of Electronic Banking on Security Cost

Security has long been an area of concern to providers and users of financial services. Traditionally, banks have been characterized by large metal doors and imposing vaults with massive and complex locking mechanisms. Financial service providers stress the safety of assets in attracting customers, and customer trust is a keystone of the financial service industry. Increasing use of telecommunication and information-processing technologies in conjunction with financial services raises two areas of concern that relate to the basic soundness of the financial service industry: system security and system integrity (Haynes and Thompson, 2000). System security deals with the problem of those who would attack the system from the outside, including those who work with the system but would attempt to invoke operations they are not authorized to perform.

In order to provide effective and secure banking transactions, there are four technology issues needed to be resolved (Pfleeger, 1997). The key areas are:

Security of the transactions is the primary concern of the Internet-based industries. The lack of security may result in serious damages. The examples of potential hazards of the electronic banking system are during on-line transactions, transferring funds, and minting electric currency among others. By strengthening the privacy technology, this will ensure the secrecy of sender’s personal information and further enhance the security of the transactions. The examples of the private information relating to the banking industry are: the amount of the transaction, the date and time of the transaction, and the name of the merchant where the transaction is taking place.

Encryption may help make the transactions more secure, but there is also a need to guarantee that no one alters the data at either end of the transaction. There are two
possible ways to verify the integrity of the message. One form of verification is the secure Hash algorithm which is “a check that protects data against most modification.” The sender transmits the Hash algorithm generated data. The recipient performs the same calculation and compares the two to make sure everything arrived correctly. If the two results are different, a change has occurred in the message. The other form of verification is through a third party called Certification Authority (CA) with the trust of both the sender and the receiver to verify that the electronic currency or the digital signature that they received is real. Electronic money may be divisible into different units of currency, similar to real money. For example, electronic money needs to account for pennies and nickels.

2.4 Conclusion

This paper therefore will establish the effect of online banking on cost efficiency in commercial banks in Kenya. The empirical studies have provided the information of online banking on general performance of organisation. Studies reviewed shown a positive relationship between online banking and general bank performance. This study will specifically test on whether the technology is efficient in terms of cost or not. Since many commercial banks in Kenya are adopting e-commerce it is important to study the cost comparative advantage of adopting online banking.

This project will describe the current state of internet banking in Kenya and discusses its implications for the Kenyan banking industry. Particularly, it seeks to examine the impact of Internet banking on banks’ cost efficiency. Using information drawn from the survey of 43 scheduled commercial bank's websites, during the period of June 2010, Kenyan commercial banks are providing transactional Internet banking sites. This study estimates online banking intensity and bank cost efficiency indices using a combination of primary and secondary data.

Online banking being a new model in the country, much needs to be done on the training of the customers and banks offering such services. This is because from the study, the researcher was able to identify that most of the customers will use online banking of their preferred bank and expect the same customer service they receive at
the banking hall which in most cases is not the same. The commercial banks also need devise ways of dealing with the problems associated with online banking which include security associated to frauds on customer and the bank.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methodologies that were used to carry out the study. This included the study design, target population, data collection tools used, data collection techniques, data analysis and presentation.

3.2 Research Design

The study employed descriptive research design. A descriptive study is used to describe or define, often by creating a profile of a group of problems, people or events, through the collection of data and tabulation of the frequencies on research variables or their interaction (Cooper and Schindles, 2003). Descriptive research design was chosen because it enabled the researcher to generalize the findings to a large population. The descriptive research approach was appropriate due to the fact it allowed analysis and relation of variables.

3.3 Locale of the Study

This study was carried out for seven commercial banks in Kenya mostly those which have adopted online banking services to determine the impact on cost efficiency.

3.4 Target Population

Mugenda & Mugenda (2003) defined a sample as a small proportion of a target population selected using some systematic procedure for study. It is used in selecting a given number of subjects from a Target population as a representative of that population. Ngechu (2006) defined a population as a complete set of individuals, cases, or objects with some common observable characteristics. A particular population has some characteristics that differentiate it from other populations. He further indicated that a target population is a group of individuals, events or objects which a researcher wants to generalize the findings. In this study, the target population will be 43 Commercial banks. A sample of seven banks were selected i.e.
Kenya commercial bank, Equity bank, Barclays bank, Co-operative bank, Family bank, National bank and Standard Chartered bank. Since the total population is 43 commercial banks a random sampling was used to narrow down the sample size to seven commercial banks. This resulted in the same probability for each possible sample.

3.5 Data Collection Instruments

The study used secondary data for the information regarding cost incurred by commercial banks in their operations of online banking. The secondary data was collected from banks newsletters, banks Journals, financial statements for at least five financial years and other officially published statistical data pertaining to Banks performance from CBK.

3.6 Piloting

3.6.1 Piloting the Study

Pre-testing of the data collection instruments was done before the actual field research which was carried out so as to evaluate the validity and reliability of the research instruments in piloting 4 randomly selected operational managers one from each branch was selected. (Mugenda and Mugenda 2003) caution the use of subjects in the actual sample into the pretext. The main purpose of pilot study was to find out the following:- Whether the structured data collection form covers all the indented dimensions of the research, whether they were clear and unambiguous and whether the space was adequate for the answers. Pilot data was analysed and results used to modify and collection form before rolling out the instrument to the entire sample population.

3.7 Reliability of the Instrument

Reliability refers to a measure of the degree to which research instruments yield consistent results (Mugenda and Mugenda 2003). To ensure a good quality of research, validity and reliability of data must exist. Trochim (2005) explain reliability to relate to quality of measurement.
3.9 Validity of the Instrument

Validity is the degree to which results obtained from the analysis of data actually represents the phenomenon under study. Validity was done through pre-testing of data collection instrument clarity and its ease to use, Mugenda and Mugenda (2003) highlights the benefit of pre-testing of instrument as that of allowing errors to be discovered as well as a tool for training a research team before the actual data collections began. This was achieved by pre-testing instrument used to identify and change any ambiguous, awkward, or offensive questions (Cooper and schindler, 2003).

3.10 Data Analysis

Data collected was analysed by descriptive statistics. The descriptive statistical tools such as frequencies, percentages, mean and standard deviation helped the researcher to describe the data. In addition advanced statistical technique (inferential statistics) were also used. The above were calculated tabulated using frequency distribution tables, pie charts and bar charts. In order to test relationship between the variables the inferential tests including the pearson product – moment correlation coeffient and regression analysis were used.

Second Multiple linear regressions was used to determine the relationship between the independent and dependent variables. SPSS (statistical package for social sciences), M S excel were also used to analyze the data. The researcher used content analysis to analyze qualitative data. Given the five year panel structure of sample data was gathered, regression analysis was conducted to investigate the relationship between online banking on cost efficiency.

The following regression Model was used:

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \]

Where;

- \( Y \): Cost efficiency represented by Return on Assets.
- \( \alpha \): Is the constant of Regression.
- \( X_1 \): Variable investment/Operational cost in online banking measured in Kshs.
- \( X_2 \): The variable cost of labour in terms of number of employees on online banking.
X3: The variable other income include interest from loans, bank charges, fees and commissions and Forex income associated cost.
Department and cost associated with employment of such staff.

ε: Random error of regression.

Gatte (2012) and Gichana(2011) used this model in their study.

β1, β2 and β3: Slope coefficients whose sign depict the relationship between return on assets as a measure of bank and online banking proxied by investment in online banking measured in kshs, Labour cost measured by number of employees and their remunerations, operational cost associated with the online banking and other factors which determine return on assets such as revenues as result of income and fees charged by the bank, interest from loans and bank charges.

ROA is the dependent variable in the regression equation while operational costs and labour costs are independent variables. The regression model is expected to assume the following expression:

\[ \text{ROA} = K + \text{OPSC} + \text{LABC} + \text{OINCOMEC} + \varepsilon \]

In the above equation;

ROA represents the returns on Assets of a commercial bank.
K represents the intercepts or constant
OPSC represents operational cost.
LABC represents labour costs.
OINCOMEC represents other income associated cost as illustrated above.

For each t-test was used to determine the significance of the constant term and coefficient term. The F-test was used to determine the importance of each regressions. This test was done at 95% confidence level. The coefficient of determination R2 was used to measure the strength to which independent variables explain variations in the dependent variable.
CHAPTER FOUR

4.0 DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter covers data analysis in a descriptive and inferential manner. It gives the various research findings with a note to the research findings alongside. For the inferential analysis, the study used the pearson correlation the panel data regression analysis and the t-test statistics. It shows the performance of online banking in terms of cost for the banks for the last five years. Chi – square tests were also carried out to compare profitability among different banks.

4.2 Data presentation

4.2.1 Relationship between Operating Cost and Labour Cost

Table 4.1 Research Population

<table>
<thead>
<tr>
<th>ROA( Y)</th>
<th>Operating Cost (X1)</th>
<th>Labour Cost (X2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2049017.4</td>
<td>2215652.6</td>
<td>2337727</td>
</tr>
<tr>
<td>10929390</td>
<td>7010933.6</td>
<td>7686971.8</td>
</tr>
<tr>
<td>556427.6</td>
<td>1361040</td>
<td>953161.6</td>
</tr>
<tr>
<td>9490272</td>
<td>6591679.4</td>
<td>4322317.6</td>
</tr>
<tr>
<td>5732490.8</td>
<td>6451299</td>
<td>7576629.6</td>
</tr>
<tr>
<td>11132259.8</td>
<td>2567099.6</td>
<td>3165931.2</td>
</tr>
<tr>
<td>7788294</td>
<td>5236050.2</td>
<td>450702.2</td>
</tr>
</tbody>
</table>

The table above shows operating cost and labour costs relating to online banking and respective returns as a result of adopting online banking. This has been analyzed for the last five years since 2008 to December 2012. The table shows that the banks which have invested heavily on online banking have higher operating costs and labour costs although the return on assets is higher. From the table banks which have heavily invested in online banking such as Barclays, KCB, Equity are the best performing banks in the Country.
4.2.2 Summary Output

Table 4.2 Regression Statistics

<table>
<thead>
<tr>
<th>Regression Statistics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple R</td>
<td>0.611053973</td>
</tr>
<tr>
<td>R Square</td>
<td>0.373386958</td>
</tr>
<tr>
<td>Adjusted R Square</td>
<td>0.060080437</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.4088910491</td>
</tr>
<tr>
<td>Observations</td>
<td>7</td>
</tr>
</tbody>
</table>

This means that 0.3733 which translates to 37.33% variation which is return on assets is determined by labour costs and operation costs this concludes that the online banking plays a great role in determination of cost efficiency under commercial banks in Kenya. For the banks that do not use online banking in their transactions misses the advantage of 37.33% which is a clear indication of efficiency in their operations.

4.2.3 Analysis of Variance (ANOVA)

Table 4.3 ANOVA Statistics

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>Significance F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2</td>
<td>3.98506E+13</td>
<td>1.99253E+13</td>
<td>1.191762487</td>
<td>0.392643904</td>
</tr>
<tr>
<td>Residual</td>
<td>4</td>
<td>6.68768E+13</td>
<td>1.67192E+13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>1.06727E+14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The ANOVA (analysis of variance) table splits the sum of squares into its components.

Total sums of squares
= Residual (or error) sum of squares + Regression (or explained) sum of squares.

The column labeled F gives the overall F-test of H0: $\beta_2 = 0$ and $\beta_1 = 0$ versus Ha: at least one of $\beta_2$ and $\beta_1$ does not equal zero.

The column labeled significance F has the associated P-value.
Since 0.167 > 0.05, we do not reject H0 at significance level 0.05.
### 4.2.4 Regression Coefficients Interpretation

#### Table 4.4 Regression Coefficients Statistics

<table>
<thead>
<tr>
<th></th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t Stat</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1939378.223</td>
<td>3515474.721</td>
<td>0.551668943</td>
<td>0.610543979</td>
</tr>
<tr>
<td>Operating costs</td>
<td>1.073953901</td>
<td>0.985457869</td>
<td>1.089801943</td>
<td>0.337055294</td>
</tr>
<tr>
<td>Labour costs</td>
<td>0.012988154</td>
<td>0.798733843</td>
<td>0.016260929</td>
<td>0.987804975</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Lower 95%</th>
<th>Upper 95%</th>
<th>Lower 95.0%</th>
<th>Upper 95.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-7821144.358</td>
<td>11699900.8</td>
<td>-7821144.358</td>
<td>11699900.8</td>
</tr>
<tr>
<td>Operating costs</td>
<td>-1.662115777</td>
<td>3.810023578</td>
<td>-1.662115777</td>
<td>3.810023578</td>
</tr>
<tr>
<td>Labour costs</td>
<td>-2.204652513</td>
<td>2.230628821</td>
<td>-2.204652513</td>
<td>2.230628821</td>
</tr>
</tbody>
</table>

Let $\beta_j$ denote the population coefficient of the $j$th regressor (intercept, operating cost and labour cost). Then Column "Coefficient" gives the least squares estimates of $\beta_j$. Column "Standard error" gives the standard errors (i.e. the estimated standard deviation) of the least squares estimates $\hat{\beta}_j$ of $\beta_j$. Column "t Stat" gives the computed $t$-statistic for $H_0: \beta_j = 0$ against $H_a: \beta_j \neq 0$. This is the coefficient divided by the standard error. It is compared to a $t$ with (n-k) degrees of freedom where here $n = 7$ and $k = 3$. Column "P-value" gives the p-value for test of $H_0: \beta_j = 0$ against $H_a: \beta_j \neq 0$. This equals the $\Pr(|t| > t_{\text{Stat}})$ where $t$ is a $t$-distributed random variable with n-k degrees of freedom and $t_{\text{Stat}}$ is the computed value of the t-statistic given in the previous column. Note that this p-value is for a two-sided test. For a one-sided test divide this p-value by 2 (also checking the sign of the t-Stat). Columns "Lower 95%" and "Upper 95%" values define a 95% confidence interval for $\beta_j$.

A simple summary of the above output is that the fitted line is

$$ Y = 0.1939378 + 1.07X_1 + 0.0013X_2 $$
4.2.5 Confidence Intervals for Slope Coefficients

95% confidence interval for slope coefficient $\beta_2$ is from Excel output (-1.662, 3.810).

4.2.6 t-Test: Paired Two Sample for Means

Table 4.5 t- Test Statistics

<table>
<thead>
<tr>
<th></th>
<th>Operating costs</th>
<th>Labour costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4490536.343</td>
<td>3784777.286</td>
</tr>
<tr>
<td>Variance</td>
<td>5.63934E+12</td>
<td>8.58421E+12</td>
</tr>
<tr>
<td>Observations</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>0.700846189</td>
<td></td>
</tr>
<tr>
<td>Hypothesized Mean Difference</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Df</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>t Stat</td>
<td>0.883083821</td>
<td></td>
</tr>
<tr>
<td>P(T&lt;=t) one-tail</td>
<td>0.205586505</td>
<td></td>
</tr>
<tr>
<td>t Critical one-tail</td>
<td>1.943180274</td>
<td></td>
</tr>
<tr>
<td>P(T&lt;=t) two-tail</td>
<td>0.411173009</td>
<td></td>
</tr>
<tr>
<td>t Critical two-tail</td>
<td>2.446911846</td>
<td></td>
</tr>
</tbody>
</table>

The above table shows t-test which is used when two conditions are fulfilled viz., When the sample size is 30 or less and the population variance is not know. For applying t-test, we work out the value of test statistic which in our table is 0.88 and then compare with the table value of t at certain level of significance for given degrees of freedom. If calculated t value is less that the concerning table value of t, the difference is not treated as significant. In Our case the difference is treated as significant. The mean for operating costs is higher than the one for labour costs. This is a clear indication higher cost is incurred under operations than on human resources. This implies less labour cost is incurred compared to operating costs.

4.2.2 Descriptive Analysis for Operating Cost and Labor Costs

The descriptive analysis is very important as it gives a summary of the independent variables i.e. operating costs and labour costs. It is a generated report of univariate statistics for data in the input range providing information about the central tendency and variability of the data
From the above table we are able to get mean, Standard error, Median and standard deviation which are very crucial for this report. We deduce that mean for operating cost is higher than mean for labour cost. This means that more cost is incurred under operations than labour. The reason behind this is than online banking tend to reduce number of employees as their work is done by computers and other machines e.g under agency banking.

### 4.2.3 F-test Two Sample for Variance

F test performs a two sample F-test to compare two population variance. From output table if f<1 ‘P (F<f) one tail. A value off close to 1 provides that the underlying population variance are equal.
Table 4.7 F-test Sample for Variance

<table>
<thead>
<tr>
<th></th>
<th>Operating Cost</th>
<th>Labour Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4490536.343</td>
<td>3784777.286</td>
</tr>
<tr>
<td>Variance</td>
<td>5.63934E+12</td>
<td>8.58421E+12</td>
</tr>
<tr>
<td>Observations</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>df</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>F</td>
<td>0.656943543</td>
<td></td>
</tr>
<tr>
<td>P(F&lt;=f) one-tail</td>
<td>0.311373988</td>
<td></td>
</tr>
<tr>
<td>F Critical one-tail</td>
<td>0.233434021</td>
<td></td>
</tr>
</tbody>
</table>

From the table above since F 0.65 is near to one than Zero then it means the two costs are related and their variances are almost the same i.e. 5.6 and 8.5

FIGURE 4.1 OPERATING COSTS

The figure above shows percentage operating cost under different commercial banks as contribution on online banking the Bank contribution on cost is related to its performance. Family bank has lowest percentage of 4% and have not been full online banking they have also invested less compared to others. KCB has highest percentage of 22% a clear indication of high investment in online banking and this has resulted to
higher returns on their assets. They are in the same level with Equity 21% Barclays Bank of Kenya with 21%. Following closely is Cooperative Bank with 17%. Lastly Standard Bank with 8% has not done so well but this might be attributed by number of branches in the country.

FIGURE 4.2 LABOUR COSTS

The contribution of labour cost on online banking is highly related with operating cost this is a clear indication that online banking is highly dependent on the two variables. This can be confirmed by return on assets which corresponds to almost the same percentage. This is illustrated by the following figure. The trend on labour cost is a bit different with Barclays and KCB 25% meaning that for the last five years many banks have been investing on online banking hence more on labour cost. Equity bank seems to be a bit efficient on labour cost since the cost is 14% below Cooperative bank of 15 %. Standard chartered seem to be investing on labour hence an increment to 10%. Other banks such as Family bank national bank have 8% and 3% respectively.
FIGURE 4.3 RETURNS ON ASSETS.

The banks which have invested highly on online banking have gotten better returns and vice versa. This can be illustrated by the above pie chart. Barclays, KCB and Equity have the highest return on assets at 24%, 23% and 20% respectively the rest of the banks i.e. Cooperative 12%, standard chartered 16% and Family at 1% and National bank at 4%. This is a clear indication of performance of banks which have adopted online banking. There has been an improved profitability for these banks due to cost efficiency.

Key

<table>
<thead>
<tr>
<th>Bank</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>NBK BANK</td>
<td>1</td>
</tr>
<tr>
<td>KCB BANK</td>
<td>2</td>
</tr>
<tr>
<td>FAMILY BANK</td>
<td>3</td>
</tr>
<tr>
<td>EQUITY BANK</td>
<td>4</td>
</tr>
<tr>
<td>BARCLAYS BANK</td>
<td>5</td>
</tr>
<tr>
<td>STANDARD CHARTERED BANK</td>
<td>6</td>
</tr>
<tr>
<td>COOPERATIVE BANK</td>
<td>7</td>
</tr>
</tbody>
</table>
4.3 Summary and Interpretation of Findings

The findings indicate that out of 43 banks, 7 have rolled out online banking service with KCB, Equity and Barclays bank showing significant performance index. The findings further showed that those banks that have adopted online banking since 2008 have improved their performance for instance KCB bank has been doing better compared to others. Previously we are aware that Barclays was always leading but this scenario has changed. We find from the results that there is a lot of correlation between adoption of online banking and cost efficiency under commercial banks in Kenya.

From the data R-squared value is 0.373 which indicates that the regression explains 37.3% of the variation of the performance of all banks in the sample. F value indicates that at least one of the independent variables is significantly related to the cost efficiency subset of banks performance. Further the computed t-value for online banking, size of bank, credit risk, liquidity of bank and economic growth are significant at the 10%, 5% and 1% level.

The cost associated with online banking which include electronic infrastructure, continuing maintenance and employees training are comparatively lower compared to the revenues gained by commercial banks. This might have been facilitated by customers who no longer want traditional channels to carry out their banking operations rather opt for electronic channels. In Kenya people and institutions in both private and public sectors are gearing up their efforts towards the maximum use of the internet and information technology (Migdadi, 2008).

The bank specific variable size shows a positive and significant relation to performance measures. One of the explanations to this is that large banks have more resources, more investments channels, better and more qualified managers and enjoy
economies of scale. Hence more ROA as portrait by KCB, Barclays and Equity (Al-Smadi, 2011). This can be compared by findings by Flamin etal, (2009) who studied the determinants of banks profitability in 389 banks in 41 sub- Saharan African. He gave determinants to be the above factors hence very general study.

The revolution of technology and communication has affected many businesses significantly. Banks have fairly financial liberalization and pressure of internal completion and hence need to improve the performance and be competitive. Many banks in Kenya have now started adopting online banking as a way of trading with their clients. However, Previous banking studies show mix results about impact of online banking on banks performance. The studies have failed to single out cost variables and confirm their efficiency on cost but all a coiled on general bank performance. An example of such is by Al-Smadi (2011) on his journal Internet banking and Commerce, August 2011. Thus a need of getting specific factors affecting performance e.g. cost.

The major findings are as follows: Adopting of online banking affects cost efficiency positively. Online banking is very important as it affects cost efficiency for banks that have operated for more years that those which have not adopted the system. The cost comparatively decreases as the number of operations increases, this is due to reason that some employees in the long run will be laid off as their services will be offered through online banking hence less work force needed. The study has reviewed that online banking has increased efficiency and reduced costs for customers through the reduced need for queuing in the bank for some transaction which should have been done otherwise. Queuing results in customers foregoing some other activities that they should have done hence opportunity cost. This can be confirmed through the behavior of clients who have joined the profitable banks to get advantage of advanced technology online banking.

Banks in Kenya should focus its work to promote the confidence of online banking and develop marketing policies that encourage customers to use the services. Big banks in Kenya make more profits compared to small banks. This banks for instance
Barclays, KCB, Equity and standard chartered bank and cooperative have advantage to improve its performance compared to smaller ones. This can be done through economies of scale, High level off credit risk and high liquidity which affects bank negatively and might lead to low profits. These factors should be well managed by highly investing into current technology i.e. online banking.

Banks in Kenya should take advantage of good economic conditions to improve on banks performance. Combining above factors together with cost efficiency will lead to higher profits so as to mitigate the negative effects that may be faced by the banks during the economic recession. In overall the analysis leads to the conclusion that online banking have resulted in improved efficiency and banking costs reductions for customers in Kenya. This shows that there is need to improve on use of online banking to further improve the efficiency and cost reductions in banking for the benefits of the customers. Despite these banks need to solve some of the challenges and problems resulting from one use of technological innovation such as increase frauds and robberies, technical complexities in operating new technologies and securing their systems.
CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The study aimed to establish the status of online banking in the country and contribution of that to cost efficiency. The research was done through analyzing financial data collected from banks in Kenya that use online banking. Cost related to online banking such as labour cost and operating cost and return on assets as result of adopting online banking was analyzed. It was found that online banking has a great impact on cost efficiency which has contributed to better performance of commercial banks in the country for the last five years. Online banking has also facilitated reaching of marginalized people to have access to online banking through use of their mobile phones and agency banking which are subset of online banking this has increased not only banks efficiency but has reduced banking cost to rural areas.

The banks with strong networks in terms of online banking for instance KCB, Equity bank are leading in their performance i.e. profitability compared to those banks limited to online banking e.g Family Bank. These leading financial providers have different avenues of online banking such as agency and mobile banking.

Using linear regression technique, the study analyzed the relationship between online banking and cost efficiency. Before 2006 many banks were operating on manual basis hence they had not adopted online basis through online banking many people are now able to access banking services at comfort of their houses this has reduced cost of operation hence an increase in profits. The same has also increased customers base among commercial banks.

5.2 Conclusion

From the findings above, it can be concluded that majority of the banks in the country have not embraced online banking. This can be confirmed through low profits amongst commercials banks and higher operating cost. Less than 10 banks in Kenya
have adopted fully online banking and this has affected these banks especially in their performance. It can further be concluded from the findings that KCB and Equity are the most performing bank among commercial banks due to adoption of online banking.

The study reviewed that online banking has increased efficiency and reduced costs for customers through the reduced need for queuing in the bank for some transaction which should have been done otherwise. Queuing results in customers foregoing some other activities that they should have done, hence the opportunity cost.

Facilitation of online banking has increased the number of customers which has in turn increased operational cost but at decreasing rate as portrait by the most performing banks i.e KCB, Equity, Barclays among others. Further to this agency banking which is part of online banking has the effect of increasing financial inclusion. This can be enhanced by increasing the number of agents within the country and supporting the existing agents to ensure they do more transactions and have capacity to handle even high volumes transactions without turning customers away.

It was further concluded than banking cost has relatively reduced since adoption of online banking to the customers, government and this has positively performance of commercial banks. In overall, the analysis leads to the conclusion that online banking have resulted in improved efficiency and banking costs reductions for customers. This is depicted by the statistical inferences discussed. The analysis showed positive responses with respect to the improvement of efficiency in the banking sector and cost reductions as a result of the use of online banking. This shows that there is need to improve on the use of other Online banking to further improve the efficiency and cost reductions in banking for the benefit of customers. Despite the fact that online banking have resulted in improved efficiency and reduced costs of banking for customers, customers are facing problems in using these online banking. Some of the problems resulting from the use of technological innovations include increased levels of fraud and robberies, the technical complexities in operating the new technologies coupled with illiteracy and lack of personal or human contact.
5.3 Policy Recommendation

The study recommends that online banking as a means of enhancing cost efficiency be highly supported and encouraged by all players i.e. banks and government, regulators and other sectors. They should work towards ensuring minimum set up costs especially taxes and licenses on users of online banking. Local authorities usually charge agents exorbitantly to allow as well as easing the documents required before approval by central bank, some of which make the application process very lengthy particularly for the businesses which are joint venture. The banking sector should be able to determine the technical background of the majority of its customers before endeavoring into the use of online banking to avoid unnecessary costs. This entails assessing the literacy level of its major customers, the specific needs of its target customers and the potential benefits accruing to customers through the use of current technologies. This can be achieved through carrying a customer research.

In addressing the problems that customers face with the use of online banking advances and to further improve the efficiency of the banking sector and reduce costs for customers, the banking sector should: Engage in customer education on the use of online banking, Carry out compatibility tests before introducing online banking to assess acceptance by customers, Improve on the security systems for improved safety in the use of online banking, Develop technologies that are simple to operate for an ordinary customer and Employ skilled and qualified staff that would be able to assist customers with the use of online banking This will assist the banking sector to further improve its service delivery for the benefit of increased efficiency and ultimately, profitability. Improving the welfare of customers is paramount for the bank to gain a positive image, thus, developing online banking that minimize banking costs for customers is paramount to the success of the banking sector.

The government should support the online programme more often and reduce the high compliances costs, bureaucracy in registration and high cost of taxation. The study also recommends that the government dealing with the cumbersome laws and regulation, corruption and illegal permits and licenses; regulation should be efficient to enable more banks embrace online banking service. The study further recommends
that all commercial banks should embrace online banking through adoption of improved technology for information security to make it more reliable to the customers all these will lead to higher levels of financial inclusion.

5.4 Limitation of the Study

Online banking is relatively a new concept in Kenyan banking industry hence literature on studies especially in relation to cost efficiency is limited. Many studies have specialized on general performance and none has tackled to cost efficiency.

The study looked on country in general but branches and customers in different localities have different problems especially cost related to online banking, high cases of identity theft, complexity in operation of online banking for ordinary illiterate customer, increased robberies and fraud cases are aspects which have affected online banking but research might have ignored it.

Some parts of the country have limitation in terms of internet and availability of network and electricity to facilitate online banking the cost in terms of online banking is not well defined in these areas.

Lastly not many financial institution have not been able to implement use of internet banking to customers due to initial capital required and funds needed hence the government has been urged to reduce the costs of implementation and give subsidies to the internet providers to make service readily available to all Kenyans.

5.5 Suggestions to Further Studies

There is need for further research to be undertaken which include factors affecting online banking in Kenya this will be advantageous to financial providers to root out whether there is comparative advantage by adopting the online banking.

The impact of cost on online banking in Kenya to know whether there is relationship between the two variables.
Impact of online banking on rural or marginalized areas in Kenya this will give an update on whether online banking has really being of great help to rural environment or not.

Lastly one can do study on role of government in supporting online banking in the county. To see whether the government has supported, adoption of online banking among commercial banks in the country.
REFERENCES


Mas, I., & Siedek, H. (2009). *Banking through Networks of Agency’s.* Focus Note47. Washington, D.C: CGAP.


APPENDICES

APPENDIX I: List of Licensed Banks (As at 31st March 2011)

<table>
<thead>
<tr>
<th>LIST OF THE RESPONDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. African Banking Corporation Ltd.</td>
</tr>
<tr>
<td>2. Bank of Africa Kenya Ltd.</td>
</tr>
<tr>
<td>3. Bank of Baroda</td>
</tr>
<tr>
<td>4. Bank of India</td>
</tr>
<tr>
<td>5. Barclays Bank of Kenya Ltd.</td>
</tr>
<tr>
<td>6. CiC Stanbic Bank Ltd.</td>
</tr>
<tr>
<td>7. Chase Bank (K) Ltd.</td>
</tr>
<tr>
<td>9. Commercial Bank of Africa Ltd.</td>
</tr>
<tr>
<td>10. Consolidated Bank of Kenya Ltd.</td>
</tr>
<tr>
<td>12. Credit Bank Ltd.</td>
</tr>
<tr>
<td>14. Diamond Trust Bank (K) Ltd.</td>
</tr>
<tr>
<td>15. Dubai Bank Kenya Ltd.</td>
</tr>
<tr>
<td>16. Ecobank Kenya Ltd.</td>
</tr>
<tr>
<td>17. Equatorial Commercial Bank Ltd.</td>
</tr>
<tr>
<td>18. Equity Bank Ltd.</td>
</tr>
<tr>
<td>19. Family Bank Ltd.</td>
</tr>
<tr>
<td>20. Fidelity Commercial Bank Ltd.</td>
</tr>
<tr>
<td>21. Fina Bank Ltd.</td>
</tr>
<tr>
<td>22. First Community Bank Limited.</td>
</tr>
<tr>
<td>23. Giro Commercial Bank Ltd.</td>
</tr>
<tr>
<td>24. Guardian Bank Ltd.</td>
</tr>
<tr>
<td>27. Habib Bank Ltd.</td>
</tr>
<tr>
<td>28. I &amp; M Bank Ltd.</td>
</tr>
<tr>
<td>29. Imperial Bank Ltd.</td>
</tr>
<tr>
<td>30. Jamii Bora Bank Ltd.</td>
</tr>
<tr>
<td>31. Kenya Commercial Bank Ltd.</td>
</tr>
<tr>
<td>32. K-Rep Bank Ltd.</td>
</tr>
<tr>
<td>33. Middle East Bank (K) Ltd.</td>
</tr>
<tr>
<td>34. National Bank of Kenya Ltd.</td>
</tr>
<tr>
<td>35. NIC Bank Ltd.</td>
</tr>
<tr>
<td>36. Oriental Commercial Bank Ltd.</td>
</tr>
<tr>
<td>37. Paramount Universal Bank Ltd.</td>
</tr>
<tr>
<td>38. Prime Bank Ltd.</td>
</tr>
<tr>
<td>39. Standard Chartered Bank (K) Ltd.</td>
</tr>
<tr>
<td>40. Trans-National Bank Ltd.</td>
</tr>
<tr>
<td>41. Victoria Commercial Bank Ltd.</td>
</tr>
<tr>
<td>42. UBA Kenya Bank Ltd.</td>
</tr>
<tr>
<td>43. Housing Finance Ltd.</td>
</tr>
</tbody>
</table>
APPENDIX II: LIST OF BANKS USING ONLINE BANKING (AS AT 31ST DEC 2008)

1. Equity bank
2. Kenya commercial bank
3. Cooperative bank of Kenya
4. Barclays bank of Kenya
5. Standard chartered bank
6. Family bank
7. National bank of Kenya
### TOTAL OPERATING COST

<table>
<thead>
<tr>
<th>BANK</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBK BANK</td>
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<td>3577197</td>
<td>4402093</td>
<td>5351289</td>
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</tr>
<tr>
<td>KCB BANK</td>
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<td>12777373</td>
<td>14644364</td>
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<td>19040943</td>
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<tr>
<td>FAMILY BANK</td>
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<td>2275294</td>
<td>2906303</td>
<td>3215656</td>
</tr>
<tr>
<td>EQUITY BANK</td>
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<td>10881849</td>
<td>13363488</td>
<td>15815061</td>
</tr>
<tr>
<td>BARCLAYS BANK</td>
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<td>13882000</td>
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<tr>
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<td>6468204</td>
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<tr>
<td>COOPERATIVE BANK</td>
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<td>11903057</td>
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### OPERATING COST

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<tr>
<th>BANK</th>
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<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
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<td>2139909</td>
<td>2716109</td>
<td>3352208</td>
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<td>KCB BANK</td>
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<td>6620098</td>
<td>8156613</td>
<td>9259898</td>
</tr>
<tr>
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<td>6250000</td>
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</tr>
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<td>STD CHARTD BANK</td>
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<td>4337932</td>
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<td>2910837</td>
<td>3421589</td>
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### STAFF COST

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<tr>
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<th>2010</th>
<th>2011</th>
<th>2012</th>
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<tbody>
<tr>
<td>NBK BANK</td>
<td>1693849</td>
<td>1986720</td>
<td>2262184</td>
<td>2635180</td>
<td>3110702</td>
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