

**THE EFFECT OF INTERNET AND MOBILE BANKING ON  
FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN  
KENYA**

**BY**

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## **DECLARATION**

I, Caroline Wanja Njiru, declare that this research project is my original work and has not been presented for examination in any other university.

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This research project has been submitted for examination with my approval as the University Supervisor.

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## **DEDICATION**

I dedicate this research project to my husband, for his love, support, patience and encouragement.

## **ACKNOWLEDGEMENT**

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## **ABSTRACT**

Commercial banks have been steadily introducing a host of modern customer friendly services including mobile banking and internet banking. Banking at the customer's fingertips is today a common and expected phenomenon. As a result, banks stand the chance to gain from improved competitive advantage and maintenance of customer loyalty, as well as increasing market share as a result of introduction of such facilities.

The main objective of the study was to determine the effect of internet and mobile banking on the financial performance of commercial banks in Kenya. The study was backed by literature review on mobile and internet banking and the commercial banking sector in Kenya. It used secondary data collected from the audited financial statements of the sample of forty (43) commercial banks. The data collected was analyzed qualitatively and quantitatively. The study found out that there is a significant relationship between financial performance of the commercial banks and internet and mobile banking income. This may have been as a result of increased internet and mobile banking transactions following the increased development of internet and mobile banking products by the local commercial banks and the increase in the number of people using the technology.

The study may be used by banks that are yet to implement mobile and information technology in their activities and to banks who are already involved but do not provide all the digital delivery channels for banking products and services. It will also be of importance to policy makers and government regulators as it would provide an opportunity to understand the issues and constraints that might affect the development of the internet and mobile banking sector in Kenya.

The evidence established by this study shows that mobile and internet banking impacts positively on the profitability of commercial banks and the study recommends that banks invest heavily in technological innovations that would enhance their customers continuously use mobile and internet banking. The study also recommends that policy makers observe and control developments of internet and mobile banking to ensure that policy makers do not lose their important and significant regulatory role in their development.

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## LIST OF ABBREVIATIONS

<b>ATMs</b>	-	Automated Teller Machines
<b>CBK</b>	-	Central Bank of Kenya
<b>CBR</b>	-	Credit Reference Bureau
<b>DTM</b>	-	Deposit-Taking Microfinance institutions
<b>E-banking</b>	-	Internet Banking
<b>EFTPOS</b>	-	Electronic Funds Transfer at Point of Sale
<b>ICT</b>	-	Information Communication and Technology
<b>KShs</b>	-	Kenya Shillings
<b>M-banking</b>	-	Mobile banking
<b>MFI</b>	-	Microfinance Institutions
<b>NIM</b>	-	Net Interest Margin
<b>ROA</b>	-	Return on Assets
<b>ROE</b>	-	Return on Equity
<b>PC Banking</b>	-	Personal Computer Banking
<b>SME</b>	-	Small Medium Enterprise
<b>SMS</b>	-	Short message services
<b>SSA</b>	-	Sub-Saharan Africa
<b>TAM</b>	-	Technology Acceptance Model

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Developments in Information and Communication Technology (ICT) are radically changing the way business is done in Sub-Saharan Africa (SSA). Electronic commerce is now thought to hold the promise of a new commercial revolution by offering an inexpensive and direct way to exchange information and to sell or buy products and services (Awuku, 2011). This revolution in the market place has set in motion a similar revolution in the banking sector for the provision of a payment system that is compatible with the demands of the electronic marketplace (Balachandheretal, 2001).

The last few decades have indeed witnessed extraordinary and explosive growth in ICT. This growth has continued to remove the narrow digital divide and turn the business realm into an electronic world. Internet technology has brought about a paradigm shift in banking operations to the extent that banks embrace internet technology to enhance effective and extensive delivery of a wide range of value added products and services (Oginni, 2013). Nasikye (2009) in his study of mobile banking concluded that the mobile and wireless market has been one of the fastest growing markets in East Africa and is still growing at a rapid pace. Consequently, banks are beginning to recognize the importance of developing electronic banking in order to create value to their products by making banking tasks more efficient, much cheaper and more competitive.

### **1.1.1 Internet and Mobile Banking**

Internet banking (e-banking) refers to the use of the internet as a delivery channel for banking services (Frust, Lang, & Nolle, 2000). When first introduced, internet banking was used mainly as an informational medium in which banks marketed their products and services on their websites. Now, customers can access traditional banking services such as balance enquiry, printing statements, fund transfers, bills payment and electronic bill presentation and payment. Customers benefit from being able to execute their banking business whenever and wherever they have access to the internet.

According to Chau & Lai (2003), while the rapid growth and popularity of the internet has created great opportunities, it has also created new threats to commercial sectors. For banks, the scope of competition is now not limited by the region or by country. It is more difficult to retain customer base since switching cost, an opportunity cost paid by a customer when changing financial institutions, is lowered by e-banking (Lin, Geng & Whinston, 2001).

Mobile banking (m-banking) is defined as the provision of banking and financial services through the help of mobile telecommunication devices (Okiro & Ndungu, 2013). The services that may be rendered by m-banking include access to customized information and facilities to conduct bank, stock market and accounts administration. According to Schofield & Kubin (2002), the telecommunications industry worldwide is scrambling to bring what is available to networked computers to mobile devices. This is due to the fact

that a user has access to his mobile phone all day, at all times, therefore convenience can be achieved 24 hours a day.

According to Chogi (2006), only a small percentage of the population had access to banking services due to high bank fees, lack of customized products and services, limited geographical reach and the perceived low level of demand and low bank income. In response to these challenges, banks adopted technological developments to facilitate the provision of better products and services, all which enhance customer satisfaction and at the same time, minimize operational costs (Sohail & Shanmugham, 2003).

### **1.1.2 Financial Performance**

Financial performance refers to the degree to which financial objectives are being accomplished (Trivedi, 2010). It is used to measure firm's overall financial health over a given period of time and can also be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. Financial analysts often assess firm's profitability performance, productivity performance, liquidity performance, working capital performance, fixed assets performance, fund flow performance and social performance.

Indeed, there are many different ways to measure financial performance, but all measures should be taken in totality. Line items such as revenue from operations, operating income or cash flow from operations can be used, as well as total unit sales (Jayawardhera & Foley, 2000). Profitability, which is a means to increasing shareholder's wealth, is the ultimate goal of a firm and it ensures the long term sustainability of a firm (Murthy and

Sree, 2003). The main ratios used to measure profitability include Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM).

### **1.1.3 Internet and Mobile Banking and Financial Performance**

According to Al-Smadi & Al-Wabel (2011), banks are beginning to heavily focus on their internet and mobile banking activities, leading to global expansion of electronic banking activities that explore the use of the wireless networks such as the internet and venturing into some new areas of electronic commerce such as m-banking. Banking through the internet and mobile devices has emerged as a strategic resource for achieving higher efficiency, control of operations and reduction of cost by replacing paper based and labour intensive methods with automated processes thus leading to higher productivity and profitability (Pooja & Balwinder, 2009).

Internet and mobile banking are considered beneficial because of low operational costs, time saving promptness, and interactive ability. For these reasons, banks are able to substantially reduce overhead expenses by divesting away from physical branch offices, which could be substituted by internet and mobile banking systems to enhance their profitability (Kim & Park, 2003). Banks could then use the resulting savings to reduce their loan interest rates or increase their deposit interest rates, thus retaining most profitable customers and attracting new customers without sacrificing earnings. According to Okiro & Ndungu (2013), the world is becoming increasingly addicted to conducting business across the internet and World Wide Web (WWW). Similarly, mobile banking as an innovation has progressively began to dominate commercial transactions in

major financial and other sectors of the economy and more often than not, the two are being used simultaneously to achieve efficiency.

Considering that the growth potential of internet and mobile banking consists in its cost efficiency, it is expected that investment in e-banking and m-banking would ultimately bring positive outcomes. Simpson (2002) suggests that e-banking is driven largely by the prospects of operating costs minimization and operating revenues maximization. On the other hand, Malhotra and Singh (2009) examined the impact of internet banking on performance and found that that the profitability and offering of internet banking does not have any significant association. In addition, electronic banking presents threats and challenges. Security concerns are also on the rise and according to Soludo, (2005) one security challenge results from “cutting out the middleman,” that too often cuts out the information security the middleman provides.

#### **1.1.4 Commercial Banks in Kenya**

The Central Bank of Kenya (CBK) is the primary regulator of financial institutions. As of December 2013, Kenya had 44 banking institutions (43 commercial banks and 1 mortgage finance company), 7 representative offices of foreign banks, 9 deposit-taking microfinance institutions (DTMs), 107 forex bureaus and 2 credit reference bureaus (CRBs). Out of the 44 banking institutions, there are 31 locally owned banks: three with public shareholding and 28 privately owned while 13 are foreign owned. According to a study conducted by the United States Department of State, only 33 percent of Kenyans have formal access to financial services through commercial banks. With the advent of

mobile money and its linkages to the formal banking system, the number of Kenyans with access to electronic financial services has grown rapidly.

With 29 million cell phone subscriptions, the vast majority of Kenyan adults now have cell phone access, which they use for everything from voice and SMS communication to banking, insurance, internet access, and other services. According to the World Bank, Safaricom's M-PESA processes more transactions within Kenya each year than Western Union does globally. As of June 2013, 23.3 million Kenyans were using mobile phone platforms to transfer money, according to CBK figures. There were over 103,165 agents facilitating transactions in excess of KShs 1.7 trillion (\$19.4 billion) in the fiscal year to June 2013.

According to the CBK, the increase in mobile money transfers was fuelled by a high number of consumers moving money in their bank accounts using mobile phones. M-PESA, which has a 76 percent market share, has mobile banking arrangements with 25 banks, which has contributed to greater accessibility of the service. Customers have also increased the use of internet bank platforms through a wide array of services. Mobile money platforms have been used to offer medical insurance, microloans, transfer money to a pre-paid credit card, and even to pay parking, electricity, and water bills.

## **1.2 Research Problem**

The skilled and efficient use of quality internet and mobile banking facilities by commercial banks in Kenya can greatly contribute to improved bank performance, in terms of increased market share, expanded product range, customized products and better



response to client demand. These critical dimensions can contribute to reduction of overall costs and consequently, improvement of profitability which increases shareholders wealth in the long-run. Strong financial performance, measured by Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM), is critical to the survival of a firm in both the short-run and in the long-run.

Internet and mobile banking is expected to bring cost and revenue implications and hence affect the profitability of banks adopting it (Pooja & Balwinder, 2009; Al-Smadi & Al-Wabel, 2011; Guru & Staunton, 2002). On the other hand Malhotra and Singh (2009) found that that the profitability and offering of internet banking does not have any significant association. These results mirrored those of Davenport (2003). Soludo, (2005) also set out the security challenges resulting from use of internet and mobile banking, which comes about because of the elimination of the middleman who would normally be in a position to reduce security risks.

A number of empirical studies exist in the literature, which have examined the relative performance of banks offering electronic banking services. Furst et al. (2002) found that banks offering e-banking were generally more profitable and tended to rely less heavily on traditional banking activities. Similarly, De Young et al. (2007) found that internet banks are more profitable than non-internet banks. However, when England et al. (1998) analyzed the structure and performance characteristics of banks offering electronic banking, he found no evidence of major differences in the performance of the group of

banks offering internet banking activities compared to those that do not offer such services in terms of profitability, efficiency or credit quality.

In Kenya, several studies have been conducted on electronic banking. Mutua (2011) investigated the effects of mobile banking on the financial performance of commercial banks in Kenya and found that mobile banking to a larger extent impacts the financial performance. Mutua (2011) concentrated on mobile banking whereas this study will explore both internet and mobile banking. Kingoo (2011) conducted a study on the relationship between electronic banking and financial performance of institutions in Kenya where he paid keen attention on the Microfinance Institutions (MFIs) in Nairobi. However, the current study is focusing on commercial banks and not microfinance institutions.

Despite the potential benefits of electronic banking, there is debate about whether and how their adoption improves bank performance (Aduda & Kingoo, 2012) and there is mixed evidence for the same in the empirical studies reviewed. This study will add to the existing literature by investigating the effect of internet and mobile banking on financial performance of commercial banks in Kenya. In addition, chunks of empirical studies exist on the performance of banks adopting electronic banking in general, a term that encapsulates Personal Computer (PC) Banking, Automated Teller Machines (ATMs), Telephone Banking, Internet Banking, Mobile Banking, Electronic Funds Transfer at Point of Sale (EFTPOS) and other related interactive communication channels. No sufficient exploitation study had been done specifically on the effect of internet and

mobile banking on commercial bank's financial performance. This study therefore sought to fill in this gap by looking at internet and mobile banking distinctively.

### **1.3 Research Objective**

To determine the effect of internet and mobile banking on the financial performance of commercial banks in Kenya.

### **1.4 Value of the Study**

The research served as a reference to companies (especially banks), yet to implement the usefulness of information technology in their activities and to banks who are already involved but do not provide all the delivery channels for banking products and services. It will also enable customers to appreciate the level of influence made by electronic banking in making banking and also make them aware of the electronic delivery services that banks are offering currently and the benefits that come along with these services.

The study would used as reference material by future researchers interested in further research on internet and mobile banking and its effects on financial performance of commercial banks. The study would also be of importance to policy makers and government regulators as it would provide an opportunity to understand the issues and constraints that might affect the development of the internet and mobile banking sector in Kenya.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews the literature on the effect of internet and mobile banking on the performance of commercial banks in Kenya. Specifically, the chapter addresses the theoretical framework guiding the study, the determinants of financial performance of commercial banks, an analysis of both global and local empirical studies and a chapter summary.

#### **2.2 Theoretical Review**

This section reviews the theories that guided the study. It consists of the theories governing innovations such as mobile and internet banking as well as those theories governing the performance of commercial banks in their operations. In particular, the section looks at the financial intermediation theory which deals with the core function of financial institutions which is intermediating between the surplus and the deficit units for sustained economic development. It then reviews the diffusion of innovation theory which explains how over time, an idea or product gains momentum, diffuses and is adopted by a specific population or social system. It also reviews the technology acceptance theory, which holds that perceived usefulness and perceived ease of use of innovation play an important role from the perspective of innovation acceptance behavior.

### **2.2.1 Financial Intermediation**

According to Scholtens and Van Wensveen (2003), the role of the financial intermediary is essentially seen as that of creating specialized financial commodities. Financial intermediaries tend to exist due to market imperfections. Entrepreneurs possess inside information about their own projects for which they seek financing (Leland and Pyle, 1977). Moral hazard hampers the transfer of information between market participants, which is an important factor for projects of good quality to be financed. As such, in a 'perfect' market situation, with no transaction or information costs, financial intermediaries would not exist.

Financial intermediation is a process which involves surplus units depositing funds with financial institutions who then lend to deficit units. Bisignano (1998) and Lelandn & Pyle (1977) identify that financial intermediaries can be distinguished by four criteria: first, their main categories of liabilities or deposits are specified for a fixed sum which is not related to the performance of a portfolio. Second, the deposits are typically short-term and of a much shorter term than their assets. Third, a high proportion of their liabilities is chequeable and can be withdrawn on demand. Fourth, their liabilities and assets are largely not transferable. The most important contribution of intermediaries is a steady flow of funds from surplus to deficit units.

### **2.2.2 Diffusion of Innovation Theory**

The Diffusion of Innovation (DOI) Theory was developed by E.M. Rogers in 1962. According to the DOI theory, an innovative idea or product gains momentum and diffuses through a specific population with the end result being adoption of the product. The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative.

Researchers have found that people who adopt an innovation early have different characteristics than people who adopt an innovation later. There are five established adopter categories. Innovators, that is, people who want to be the first to try the innovation; early adopters, people who represent opinion leaders; early majority, people who adopt new ideas before the average person; the late majority, people who are sceptical of change, and will only adopt an innovation after it has been tried by the majority; and the laggards, people who are bound by tradition and very conservative.

According to Sevcik (2004), not all innovations are adopted and regardless of their quality, it may take time for an innovation to be adopted. Therefore, financial institutions need to be aware of the characteristics of adopter categories and recognize that resistance to change may be a hindrance to diffusion of innovations surrounding mobile and internet banking. The rate of adoption of new innovations will depend on how an organization perceives its relative advantage, compatibility, triability, observability and complexity.

### **2.2.3 Technology Acceptance Model**

Technology Acceptance Model (TAM) is one of the most researched areas in information technology, particularly in explaining the adoption of information technology systems (Park, 2009). The theory was originally designed to predict users' acceptance of ICT and usage in an organisational context. Generally, the model can be used to explain user behaviour across a broad range of end-user computing technologies and user populations (David, 1989).

The TAM focuses on two particular beliefs, namely, perceived usefulness (PU) and perceived ease of use (PEU) of innovation, which play an important role from the perspective of innovation acceptance behaviour. Prior empirical studies strived to explain the determinants and mechanisms of users' adoption decisions on the basis of the TAM with the conviction that the adoption process influences successful use of particular technology systems (Liao,et al.,2009).

The TAM focuses on the attitude explanations of intention to use a specific technology or service and is a widely applied model for user acceptance and usage. Bertrand and Bouchard (2008) indicate that a number of analyses on the TAM have demonstrated that it is a valid, robust, and powerful model for studying user acceptance of innovation. The model is specifically aimed at building a foundation for understanding the effects of external factors on internal beliefs, attitudes, and intentions. In their application of TAM to study adoption of M-Banking in Kenya, Lun et.al., (2012) revealed that perceived ease

of use, perceived usefulness, perceived self-efficacy, and perceived credibility significantly influenced customers' attitude towards usage of M-banking.

### **2.3 Determinants of Financial Performance of Commercial Banks**

The determinants of financial performance of commercial banks can be classified into bank specific (internal) factors and macroeconomic (external) factors (Al-Tamimi, 2010; Aburime, 2005). The external factors are sector-wide or country-wide factors which are beyond the control of the company and affect the profitability of banks. Internal factors are individual bank characteristics which affect the banks performance. These factors are basically influenced by internal decisions of management and the board.

The internal factors which influence the profitability of a specific bank are within the scope of the bank to manipulate and they differ from bank to bank. These include capital size, size of deposit liabilities, size and composition of credit portfolio, interest rate policy, labor productivity, and state of information technology, risk level, management quality, bank size and ownership.

The size of the firm has a bearing on financial performance. Large banks have the ability to generate high revenues and profits. Commercial banks with high market share and large asset base exhibit high financial performance. High performance on the commercial banking industry is determined and driven mainly by the acquisition of new customer and retention of existing ones, as well as adoption of winning strategies innovations, product differentiation and competitive pricing.



The CAMEL framework is often used by scholars to proxy the bank specific factors (Dang, 2011). CAMEL is an acronym that stands for Capital adequacy, Asset quality, Management efficiency, Earnings ability and Liquidity. Capital adequacy is the level of capital required by the banks to enable them withstand the risks such as credit, market and operational risks they are exposed to in order to absorb the potential losses and protect the bank's debtors. Capital is the amount of own funds available to support the bank's business and acts as a buffer in case of adverse situation (Athanasoglou et al. 2005). Banks capital creates liquidity for the bank due to the fact that deposits are most fragile and prone to bank runs.

The bank's asset quality is another bank specific variable that affects the profitability of a bank. Bank assets include current assets, credit portfolio, fixed assets, and other investments. Loan is the major asset of commercial banks from which they generate income. The loan portfolio quality has a direct bearing on bank profitability. The highest risk facing a bank is the losses derived from delinquent loans (Dang, 2011). Thus, nonperforming loan ratios are the best proxies for asset quality.

Management efficiency is one of the key factors that determine a bank's financial performance. The performance of management is often expressed qualitatively through subjective evaluation of management systems, organizational discipline, control systems and quality of staff. Some financial ratios such as total asset growth, loan growth rate and earnings growth rate act as a proxy for management efficiency. One of the major ratios used to measure management quality is operating profit to income ratio. The higher the

operating profits to total income (revenue) the more the efficient management is in terms of operational efficiency and income generation. However, it is generally difficult to capture management efficiency with financial ratios.

Liquidity is another factor that determines the level of bank performance. Liquidity refers to the ability of the bank to fulfill its obligations, mainly of depositors. According to Dang (2011) adequate level of liquidity is positively related with bank profitability. The most common financial ratios that reflect the liquidity position of a bank are customer deposit to total asset and total loan to customer deposits.

External factors include the macroeconomic policy stability, gross domestic product, inflation, interest rate, political instability and other sector-wide variables that affect the performances of banks. For instance, the trend of GDP affects the demand for banks asset. During the declining GDP growth the demand for credit falls which in turn negatively affect the profitability of banks. On the contrary, in a growing economy as expressed by positive GDP growth, the demand for credit is high due to the nature of business cycle. During boom the demand for credit is high compared to recession (Athanasoglou et al., 2005).

## **2.4 Empirical Studies**

A number of empirical studies exist in the literature, which have examined the relative performance of banks offering internet and mobile banking services. Egland et al. (1998) was the first important study, which estimated the number of US banks offering electronic banking and analyzed the structure and performance characteristics of these banks. It found no evidence of major differences in the performance of the group of

banks offering internet banking activities compared to those that do not offer such services in terms of profitability, efficiency or credit quality. However, transactional internet banks differed from other banks primarily by size.

In contrast to the results of Egland et al. (1998), Furst et al. (2002) found that banks in all size categories offering e-banking were generally more profitable and tended to rely less heavily on traditional banking activities in comparison to traditional banks. Similarly, Hasan et al. (2002) found that the e-banking institutions were performing significantly better than the traditional banking groups.

DeYoung et al. (2006) observed the change in financial performance of Internet community banks in U.S. during 1999-2001. The results found that electronic adoption improved community banks' profitability, particularly through increased revenues from deposit service charges. Internet adoption was also associated with movements of deposits from checking accounts to money market deposit accounts, increased use of brokered deposits and higher average wage rates for bank employees. It found little evidence of changes in loan portfolio mix. The findings suggested that internet adoption was associated with an economically and statistically significant improvement in bank profitability.

Tchouassi (2012) sought to find out whether mobile phones really work to extend banking services using empirical lessons from selected Sub-Saharan Africa (SSA) countries. This study sought to discuss how mobile phones could be used to extend banking services to the unbanked, poor and vulnerable population. The study noted that

poor, vulnerable and low-income households in SSA countries often lacked access to bank accounts and faced high costs for conducting basic financial transactions. The mobile phone presented a great opportunity for the provision of financial services to the unbanked. In addition to technological and economic innovation, policy and regulatory innovation was needed to make these services a reality.

Tiwari, Buse and Herstatt (2006) studied mobile banking as business strategy, more specifically, the impact of mobile technologies on customer behaviour and its implications for banks. The study sought to examine the opportunities for banks to generate revenues by offering value added innovative mobile financial services while retaining and even extending their base of technology-savvy customers and found a positive correlation.

According to Koivu (2002), uptake of mobile phone in Kenya has been unprecedented. Mobile banking in Kenya affects performance of organization, behaviour and decision making of the entire economy. The trend of continued reliance on mobile devices to execute monetary transaction is steadily gaining momentum. Mobile banking is one innovation which has progressively rendered itself in pervasive ways of cutting across numerous sectors of economy and industry.

Kigen (2010) studied the impact of mobile banking on transaction costs of microfinance institutions where he found out that mobile banking had reduced transaction costs considerably though they were not directly felt by the banks because of the then small mobile banking customer base.

Mutua (2011) studied the impact of mobile banking on financial performance of commercial banks in Kenya. The study concluded that there is a weak but positive relationship between mobile banking and financial performance of commercial banks in Kenya. This could be attributed to the trends which showed that financial performance of commercial banks was affected majorly by macro-economic variables like post election violence, inflation and foreign exchange rates fluctuations among other macro-economic variables.

Ochola (2013) conducted a study on e-commerce adoption among micro, small and medium sector in Nairobi County, Kenya. The study concluded that there was a significant relationship between e-commerce adoption and the technological factors of perceived compatibility, complexity, observability, trailability and security/confidentiality. The study also found that the external environmental factors obtaining in the e-commerce environment, namely, customer pressure, supplier pressure, ICT capacity, and a competitive environment were considered as significant factors influencing decision-making especially so among the small and medium enterprises.

Okiro & Ndungu (2013) studied the impact of mobile and internet banking on performance of financial institutions in Kenya. This study focused on financial institutions as a whole, unlike this study which seeks to determine the impact of mobile and internet banking specifically on commercial banks. Okiro & Ndung'u (2013) surveyed a representative sample of financial institutions within Nairobi and found that commercial banks had the highest rate of usage of internet banking among the financial institutions sampled. SACCOS are slowly adopting internet banking, while micro finance institutions have not yet adopted internet banking. The study found that mobile banking

faces various challenges among them being, system delays by the mobile money transfer service providers, slow processing of transactions, high transactions costs, limit on the amount of money that can be withdrawn in a day and fraud.

## **2.4 Summary of Literature Review**

This chapter began by analysing the theoretical framework. The financial intermediation theory holds that financial institutions exist to mediate between the surplus and deficit units in an economy by facilitating the transfer of resources. Financial intermediation theory brings out the role played by mobile and internet banking in the financial intermediation process by enabling the accessibility of banking services over the internet and mobile phone devices.

Under the diffusion of innovation theory, the key to adoption of mobile and internet banking is that the various adopter categories must perceive these services as new or innovative. In addition, the technology adoption model is relevant because it puts information technology adoption of internet and mobile banking into perspective; revealing that perceived ease of use, perceived usefulness, perceived self-efficacy, and perceived credibility significantly influenced customers' attitude towards usage of m-banking and e-banking.

Internet and mobile banking is expected to introduce competitive pressure that may bring significant changes in banks' financial performance and the structure of banking industry. Among various attributes of internet and mobile devices, such as low cost, time-saving promptness, and interactive ability, the most important is the low cost. Banks can substantially reduce overhead expenses by replacing physical branch offices with internet

and mobile banking systems, and enhance their profitability. These profits can then be channelled towards reducing lending interest rates and increasing deposit interest rates which will attract and retain more customers in the long-run. It will also be interesting to appreciate if and how increased application of internet and mobile banking will lead to greater return in investment and therefore a higher Return on Asset (ROA) ratio.

In the Kenyan context, the banking industry has inevitably found itself unable to resist technological indulgence in the wake of the emerging wave of the information driven economy. This has led to a boom in development of internet and mobile banking laying down a strong base for low cost banking, and growth of internet connected mobile phone usage in rural Kenya. However, although there is a significant growth of internet users in Kenya, there is some evidence that the number of financial transactions carried out over the internet remains very low. This trend appears to be the same globally and it has been observed that potential users either do not adopt internet banking or do not use it continually after adoption.

Various publications shed light on the importance of internet and mobile banking in Kenya. Most of the local studies focus on mobile banking in Kenya; more particularly, the impact of M-PESA, others focus on general electronic banking services such as Automated Teller Machines (ATMs), Personal Computer (PC) Banking, and Electronic Funds Transfer at Point of Sale (EFTPOS) but limited studies focus distinctively on internet banking and mobile banking together as variables that affect bank financial performance. It is this gap that the study seeks to fill.

The evidence of the impact of the adoption of internet and mobile banking as a delivery channel on financial performance of financial institutions and more particularly, commercial banks is mixed. Nevertheless, the latest studies seem to find a positive relationship with profitability. It can be argued that as the intensity and experience in the usage of internet and mobile banking increases, the financial performance of banks is likely to improve. This study will therefore focus on determining whether the relationship between internet and mobile banking and financial performance of commercial banks is positive and if so, whether it is weak or strong given the perceived increase in usage of internet and mobile banking services over the years.



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter details the research methodology that was used in the study to evaluate the effect of internet and mobile banking on financial performance of commercial banks in Kenya. It focused on the research design, population, data collection methods and data analysis.

#### **3.2 Research Design**

The study adopted a descriptive research design. Mugenda and Mugenda (2003) describes descriptive research design as a systematic, empirical inquiry into which the researcher does not have a direct control of independent variable as their manifestation has already occurred or because it inherently cannot be manipulated. Descriptive studies are concerned with the what, where and how of a phenomenon hence more placed to build a profile on that phenomenon (Mugenda and Mugenda, 2003). Descriptive research design is more appropriate because the study seeks to build a profile about the impact of internet and mobile banking on the financial performance of commercial banks in Kenya.

#### **3.3 Population**

Population in statistics is the specific population about which information is desired. According to Ngechu (2004), a population is a well defined or set of people, services, elements, events, group of things or households that are being investigated. Following the small number of institutions in the industry, the study included all the institutions hence a

census study was conducted. The target population for the study included the 43 commercial banks operating in Kenya as at December 2013 as set out in Appendix 1.

### **3.4 Data Collection**

The study used secondary data collected from the Audited Financial Statements of the sample commercial banks and those deposited at the Nairobi Securities Exchange. The data was collected using data collection sheet which was edited, coded and cleaned. Data was mainly obtained covering the period between 31st January 2009 and 31st December 2013. Monthly data was used in the analysis.

### **3.5 Data Analysis**

In order to determine the effect of internet and mobile banking on the financial performance of commercial banks in Kenya, the researcher conducted a multiple regression analysis. The relationship between the dependent variable and the independent variables are determined by the below presented regression model. Variables data was analysed using Statistical Package for Social Sciences (SPSS) Version 22.0. The regression model was of the form below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

Y = Financial Performance (FP) measured by Return on Assets

X<sub>1</sub> = Investment in Internet and Mobile Banking (IIMB)

X<sub>2</sub> = Internet Banking Income (IBI)

X<sub>3</sub> = Mobile Banking Income (MBI)

$X_4$  = Bank Size (BS)

$B_0$  = Constant

$B_1$  = Coefficient of IIMB

$B_2$  = Coefficient of IBI

$B_3$  = Coefficient of MBI

$B_4$  = Coefficient of BS

$\epsilon$  = Error or random term

The study will use F-test to test for joint significance of all coefficients. The significance of the variables in the regression model will be measured or determined by the p value; whereby, if the p value of the variable is 0.05 (5%) and below, then the variable will be deemed significant while where the p value co-efficient of the variable is above 0.05, then the relationship of the variables will be deemed to be insignificant. The beta will explain whether the relationship between the dependent and the independent variable is high or low, positive or negative; this will be revealed by the value of the beta co-efficient.

**Table 3.1 Operationalization of Research Variables**

<b>Dependent Variable</b>	<b>Indicators</b>	<b>Ratio</b>
Financial Performance	Return on Assets (ROE)	Net income divided by average total assets
<b>Independent Variables</b>		
Investment in internet and mobile banking (IIMB)	Assets invested in internet and mobile banking (in KShs)	Total assets invested in internet and mobile banking divided by the total bank assets
Internet banking Income (IBI)	Total deposits for internet banking per annum(in KShs)  Number of transactions	Total deposits for internet banking divided by the total bank deposits
Mobile banking Income (MBI)	Total deposits for mobile banking per annum(in KShs)  Number of transactions	Total deposits for mobile banking divided by the total bank deposits
<b>Control Variable</b>		
Bank Size (BS)	Measured as log of total assets in KShs.	Formula: $\log_e(x)$  Where x is the power to which e would have to be raised to equal x.

## **CHAPTER FOUR**

### **DATA ANALYSIS, FINDINGS AND INTERPRETATION**

#### **4.1 Introduction**

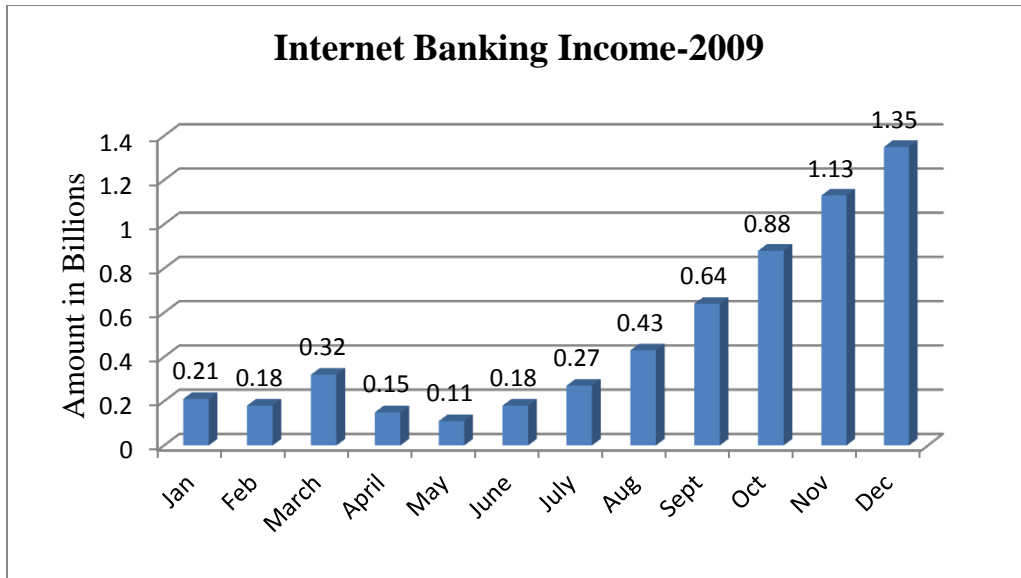
This chapter presents the findings of the study based on the data collected from the field. The study sought to determine the effect of internet and mobile banking on the financial performance of commercial banks in Kenya. The study used the secondary data which was collected from all the 43 commercial banks operating in Kenya as at December 2013.

The data obtained included amount of money invested in internet and mobile banking, incomes from internet and mobile banking, financial performance data which was measured by return on assets; the bank size which was measured by log of total assets in Kenya shillings was used a control variable in the study. The data covered a period of 5 years from 2009-2013.

#### **4.2 Descriptive Analysis**

##### **4.2.1 Internet Banking Income**

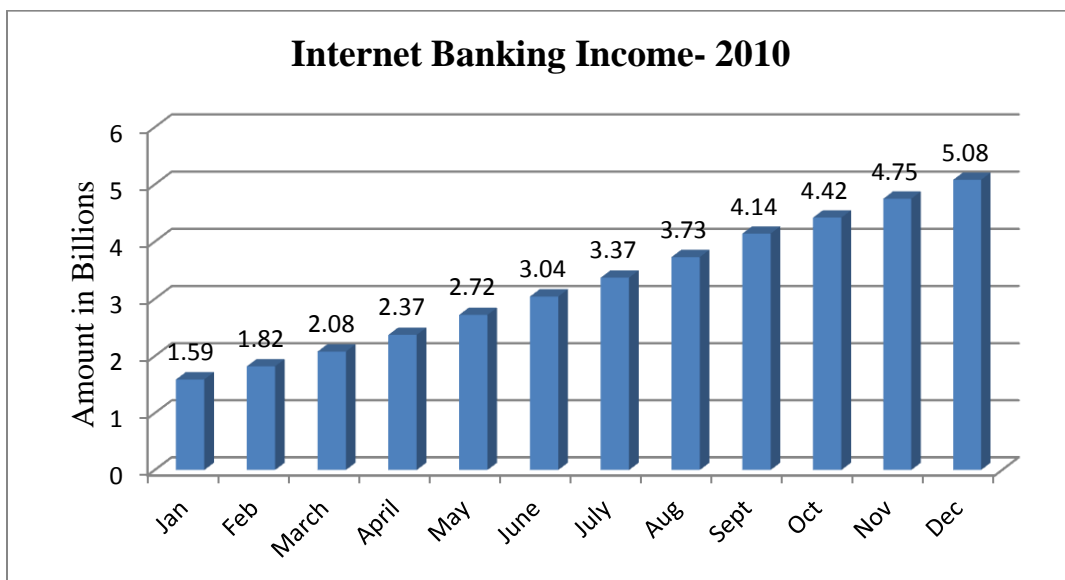
In this section, the study presents the monthly income from the internet banking transactions during the period year 2009 to 2013. The findings are presented below.



**Figure 4.1 Internet Banking Income- 2009**

**Source: Research Data (2014)**

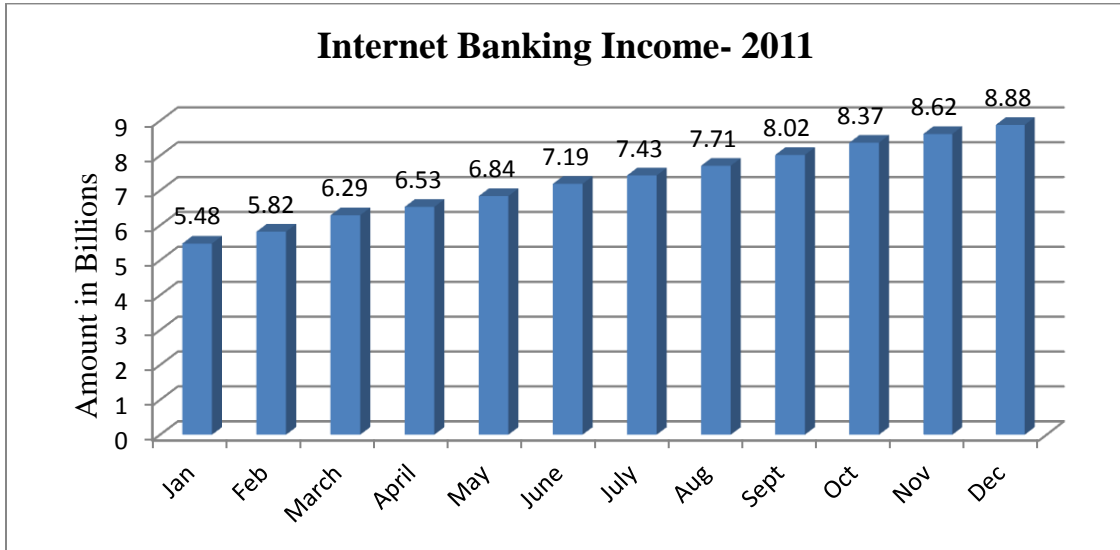
The results in the figure 4.2 above shows that in the year 2009, the total amount of internet banking income was KShs. 0.21 billion while in December of the same year, the amount was KShs. 1.35 billion.



**Figure 4.2 Internet Banking Income-2010**

**Source: Research Data (2014)**

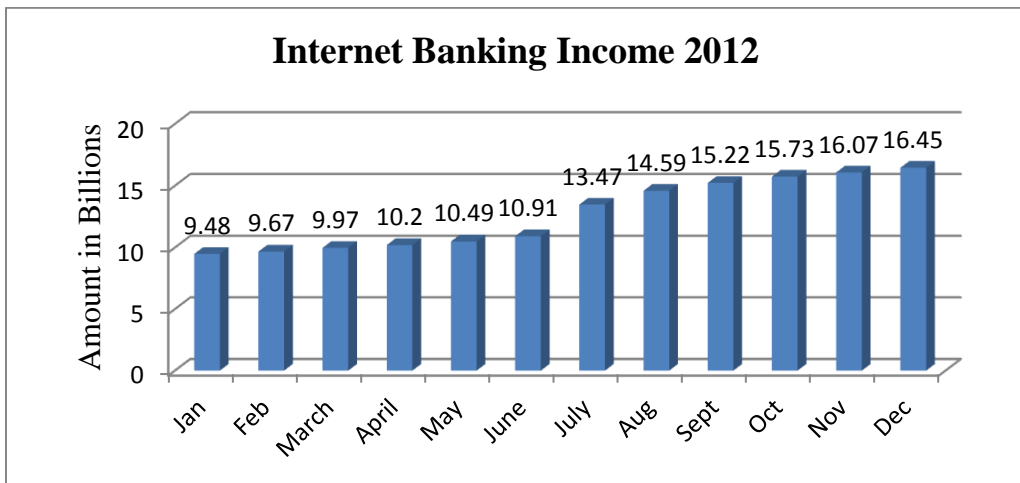
In the year 2010, the income received from the mobile banking was KShs. 1.59 billion which increased to KShs. 3.04 in June and a high of KShs. 5.08 billion in December of the same year. This shows that there was a tremendous growth all through the year.



**Figure 4.3: Internet Banking Income-2011**

Source: Research Data (2014)

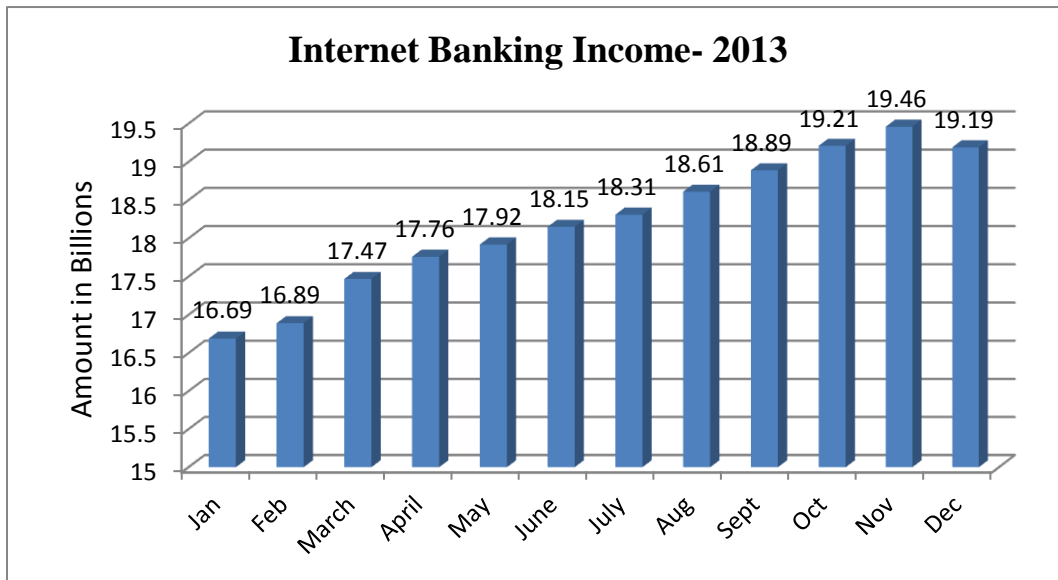
In the year 2011, the total internet banking income was KShs. 5.48 billion as at January which grew to KShs. 7.19 in June and further to KShs. 8.88 billion in December.



**Figure 4.4: Internet Banking Income-2012**

Source: Research Data (2014)

The study shows that in the year 2012, commercial banks made an income of KShs. 9.48 billion from internet banking in January, the income had an increased but sluggish trend up to June where the income was reported to be KShs. 10.91 billion but later increased tremendously to KShs. 16.45 billion in December.



**Figure 4.5: Internet Banking Income- 2013**

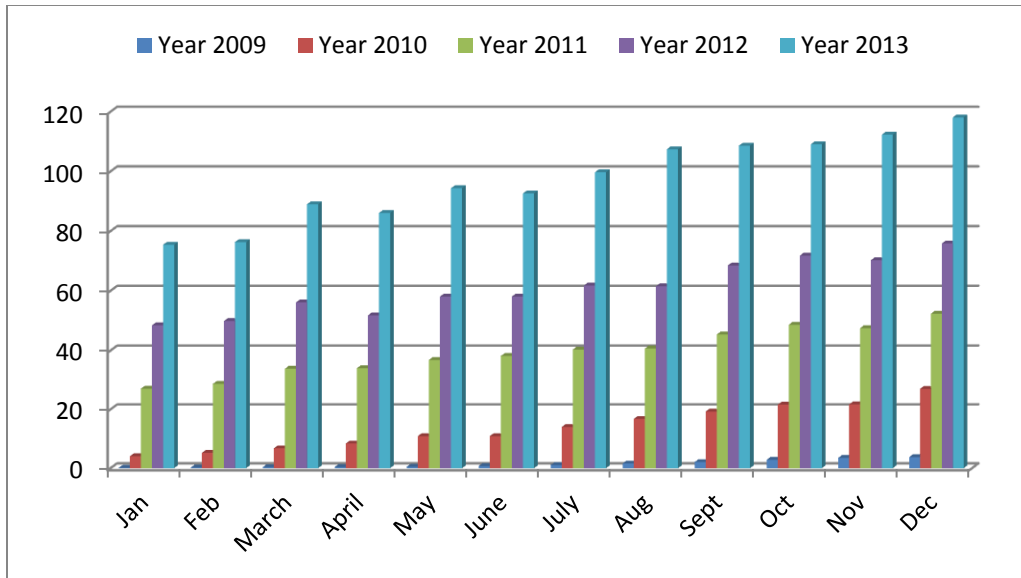
**Source: Research Data (2014)**

In the year 2013, the study shows that the value of banking income amount as at the end of January was KShs. 16.69 billion while at December, the amount was KShs. 19.19 billion. It can also be observed that the income from internet banking had increased steadily from the year 2009 to the year 2013.

#### **4.2.2 Mobile Banking Income**

In this section, the study presents the Monthly value of the mobile banking income during the period year 2009 to 2013. The findings are presented in the Figure 4.1 below.





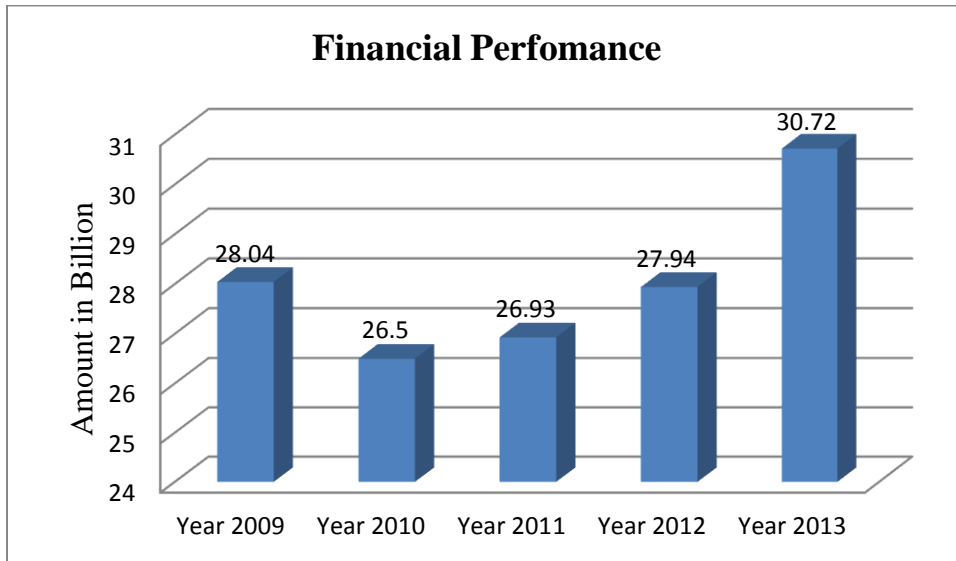
**Figure 4.6 Mobile Banking Income**

**Source: Research Data (2014)**

The findings in the figure 4.6 above, shows that the total amount of mobile banking income was KShs. 0.16 billion which grew from month to month during the year 2009 to close the year at KShs. 3.77 billion in December. In the year 2011, the total income generated from mobile banking in January was KShs. 27.07 billion which still grew rapidly during the year to close at KShs. 52.34 billion in December. In the year 2012, the mobile banking income amount as at the end of January was KShs. 48.46 billion; this amount grew steadily during the year to close at KShs. 75.87 billion. In general, there has been tremendous increase in the mobile banking income during the period, from a low figure of KShs. 0.16 billion in January 2009 to KShs. 118.08 billion by the end of the year 2013.

### 4.2.3 Financial Performance of Commercial Banks

In this section, the study presents the financial performance of the banking sector during the study period. The findings are as shown in the figure 4.7 below.



**Figure 4.7: Financial Performance of Commercial Banks**

**Source: Research Data (2014)**

The study findings in figure 4.7 shows the performance of commercial banks which was measured by Return on Equity. The study established that the commercial banks had a Return on Equity of 28.04% in the year 2009. The ROE dropped slightly in the following year 2010 to 26.5%. The ROE picked an upward trend to stand at 27.94% in the year 2012. The upward trend was maintained in the year 2013 to stand at 30.72%.

### 4.3 Regression Analysis

A multivariate regression model was applied to determine the effect of internet and mobile banking on the financial performance of commercial banks in Kenya. The study specifically sought to establish how investment in internet and mobile banking, internet and mobile banking incomes; and bank size influence the the financial performance of commercial banks. The results are presented below.

**Table 4.1 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.778(a)	0.605	0.454	.31207

a Predictors: (Constant), Investment in Internet and mobile banking, Internet Banking Income, Mobile banking Income, Bank Size

**Source: Research Data (2014)**

The R<sup>2</sup> is called the coefficient of determination and tells us how financial performance varied with the various aspects of internet and mobile banking. The regression model summary results above shows that the value of adjusted R<sup>2</sup> (coefficient of determination) is 0.454. This implies that investment in internet and mobile banking, internet banking income; mobile banking income and bank size explained 45.4% of financial performance of the commercial banks at a 95% confidence level. The remaining 54.6% would be explained by other variables not included in the study.

**Table 4.2 ANOVA Results**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.718	4	2.930	44.231	.000(a)
	Residual	0.462	7	.066		
	Total	12.180	11			

a Predictors: (Constant), Investment in Internet and mobile banking, Internet Banking Income, Mobile banking Income, Bank Size

b Dependent Variable: Financial Performance

**Source: Research Data (2014)**

The study used ANOVA to establish the significance of the regression model from which an f-significance value of  $p < 0.001$  was established. This shows that the regression model has a less than 0.001 probability of giving a wrong prediction. This therefore means that the regression model has a confidence level of over 95% hence high reliability of the results.

**Table 4.3 Coefficients Results**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.821	0.604		4.673	0.000
Investment in Internet and mobile banking	0.157	0.110	0.191	1.424	0.165
Internet Banking Income	0.332	0.067	0.717	4.946	0.000
Mobile banking Income	0.084	0.072	0.155	2.162	0.050
Bank Size	0.034	0.106	0.040	0.322	0.049

a Dependent Variable: Financial performance

The study shows that there was a positive association between the financial performance of the commercial banks and the variables- investment in internet and mobile banking (0.157), internet banking income (0.332), mobile banking income (0.084) and bank size (0.034). From the regression model, the following regression equation was established:

$$Y = 2.821 + 0.157 X_1 + 0.332 X_2 + 0.084 X_3 + 0.034 X_4$$

The study further established that there was a significant relationship between financial performance of the commercial banks and the predictors- Internet Banking Income ( $p=0.000 < 0.05$ ), Mobile banking Income ( $P=0.050$ ), bank size ( $p=0.049 < 0.05$ ). However, the relationship between financial performance of the commercial banks and investment in internet and mobile banking was found to be insignificant as shown by  $P=0.165 > 0.05$ .

#### **4.4 Summary and Interpretation of the Findings**

The study found out that internet and mobile banking income had tremendously increased from the year 2009 to the year 2013. For instance the mobile banking income increased from a low figure of KShs. 0.16 billion in January 2009 to KShs. 118.08 billion by the end of the year 2013 while internet banking income increased from KShs. 0.21 billion in January 2009 to KShs. 19.19 billion in the December 2013. However, the financial performance of the commercial banks has been fluctuating during the period but it maintained an upward trend by the end of year 2013.

The increase in mobile banking income may be as a result of increased mobile banking transactions due to increased development of mobile banking products by the local commercial banks and the increase in the number of people using mobile phones in the country. This is in line with the observations of Koivu (2002), who revealed that the

uptake of mobile phone in Kenya has been unprecedented and that the trend of continued reliance on mobile devices to execute monetary transaction had steadily gained momentum across numerous sectors of economy and industry.

The study findings also found out that there was a positive and significant relationship between mobile banking income and financial performance of the commercial banks as shown by  $p=0.050$ . These findings are in agreement with those of Mutua (2011) who sought to investigate the impact of mobile banking on financial performance of commercial banks in Kenya. The study found a positive relationship between mobile banking and financial performance of commercial banks in Kenya. This is also supported by Tiwari, Buse and Herstatt (2006) who conducted a study on mobile banking and the impact of mobile technologies on customer behaviour and its implications for banks. The study found a positive correlation mobile banking and the opportunities for banks to generate revenues by offering value added innovative mobile financial services, retaining and even extending their base of technology-savvy customers.

These findings also in line with those of Furst et al. (2002) who found out that banks offering e-banking were generally more profitable and tended to rely less heavily on traditional banking activities in comparison to traditional banks. This is also in agreement with the findings of Hasan et al. (2002) who found out that the e-banking institutions were performing significantly better than the traditional banking groups. A study by DeYoung et al. (2006) on the U.S. banks during 1999-2001 also established that electronic adoption improved community banks' profitability through increased revenues from deposit charges.

The regression results shows that the study identified a coefficient of determination value of 0.454 which implies that investment in internet and mobile banking, internet banking income, mobile banking income and bank size explained 45.4% of financial performance of the commercial banks at a 95% confidence level. The ANOVA results show an f-significance value of  $p=0.001$  was established which implies that the regression model has a less than 0.001 probability of giving a wrong prediction.

The regression co-efficient results show that there was a positive association between the financial performance of the commercial banks and investment in internet and mobile banking (0.157), internet banking income (0.332), mobile banking income (0.084) and bank size (0.034). Moreover, the study found out that at there is a significant relationship between financial performance of the commercial banks and the predictors, Internet Banking Income ( $p=0.000$ ), Mobile banking Income ( $p=0.050$ ), bank size ( $p=0.049$ ). However, there was an insignificant relationship between financial performance of the commercial banks and investment in internet and mobile banking as shown by  $P=0.165$ .

The regression analysis results also shows that the value of adjusted  $R^2$  (coefficient of determination) is 0.454. This means that investment in internet and mobile banking, internet banking income, mobile banking income and bank size explained 45.4% of financial performance of the commercial banks at a 95% confidence level. The study also found out that there was a positive association between the financial performance and the four variables. This implies that a unit increase in internet and mobile banking, internet banking income, mobile banking income, bank size would consequently increase financial performance of the commercial banks with the same factor.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Summary**

The study set out to achieve and achieved the established objective; to determine the effect of internet and mobile banking on the financial performance of commercial banks in Kenya, by examining and analyzing data from a representative sample of commercial banks within Kenya. Banking through the internet and mobile devices has emerged as a strategic resource for achieving higher efficiency, control of operations and reduction of cost by replacing paper based and labour intensive methods with automated processes thus leading to higher productivity and profitability.

Financial institutions in Kenya have adopted internet and mobile services to provide banking services to customers in Kenya and the results show that as the monthly value moved through mobile and internet banking increases, the profitability of the commercial banks increase.

The study found out that internet and mobile banking income had tremendously increased from the year 2009 to the year 2013. However, the financial performance of the commercial banks has been fluctuating during the period but it maintained an upward trend by the end of year 2013. The regression co-efficient results show that there was a positive association between the financial performance of the commercial banks and investment in internet and mobile banking, internet banking income, mobile banking income and bank size.



## **5.2 Conclusions**

The study concludes that there has been tremendous increase in the mobile banking income and internet banking income in commercial banks in Kenya. This increase in mobile banking and internet banking incomes may be as a result of increased innovations and increased use of mobile phones among customers. The high reliance on mobile phones and other communication devices have enhanced increased use in business transactions which also involves even the commercial banks.

The study also concludes that there is a positive and significant relationship between financial performance of the commercial banks and internet banking income as well as mobile banking income. This means that a unit increase in mobile banking and internet banking leads to a unit increase in increased income of the commercial banks which leads to increased profits.

Banks in Kenya have achieved more than a decade of boosting their earning capability and controlling costs through adoption of innovations like the mobile banking, internet banking. The study results show these bank innovations have significant influence on profitability of commercial banks in Kenya. The significance test showed that effect of bank mobile banking and internet banking innovations on bank profitability was positive and statistically significant. This means that the combined effect of the bank innovations in this research is statistically significant in explaining the profits of commercial banks in Kenya.

### **5.3 Recommendations to Policy and Practice**

The study recommends that policy makers consider mobile and online banking in their formulation of strategies because of the technological developments and the expected switch from physical branch networks to technologically supported banking services. The increased use of technology among the customers calls for commercial banks to develop products and services that are linked with these technological developments.

The banks also need to put in place measures to become more competitive by training its staff, investing in research and development of technology. The evidence established by this study that mobile and internet banking impacts positively on the profitability of commercial banks calls for the banks to invest heavily in technological innovations that would enhance their customers continuously use mobile and internet banking.

Since profitability has continued to be a key performance indicator for many companies and an importance reference point for shareholders. The market is also keen on the profitability of organizations. Any ethical and responsible attempt to improve profitability of a company will be appreciated not only by the shareholders but also the government in view of the tax that accrues from profits from corporations. Commercial banks should therefore continue to adopt new technologies which will improve their margins and hence their profitability.

The government policy makers should also review policies related to promotion of innovation adoption and transfer of technology. Government should encourage adoption of innovations that will improve profitability of organizations because it will convert to better tax revenues for the government and healthy companies.

## **5.4 Limitations of the Study**

In the pursuit of conducting this study, the researcher experienced some challenges that could have limited the achievement of the study objectives. One of the main limitations was the access to data from commercial banks. Some of the banks were unwilling to share their records and data on agency banking for fear that the data may be used by their competitors or released to other unauthorized persons. However, the researcher overcomes this challenge by informing the management of the banks on the actual purpose of the study; the researcher also followed ethical procedures and ensured confidentiality of the data given.

The other limitation on data is that this study relied on secondary data generated for other purposes hence may not accurately predict the relationship among the variables. Moreover, the measures for instance for performance used may keep on varying from one year to another subject to the prevailing condition.

Another limitation for the study included the short period which especially mobile banking has been in existence which could not give a long trend for analysis. Mobile banking was only introduced in Kenya in 2007. It has only been six years since the launch which may not give a clear picture of the relationship as not all commercial banks have adopted mobile banking in its operations.

Lastly, this study did not factor in the changes in the macroeconomic environment and factors such as inflation, change in interest rates, among others that could have affected the financial performance of commercial banks. The existence of macroeconomic factors would affect the relationship between financial performance and the variables.

## **5.5 Suggestions for Further Studies**

The study suggests that further research be conducted on the the effect of internet and mobile banking on the financial performance of commercial banks in Kenya. This study only concentrated on Kenya commercial banks yet there are other financial institutions such as SACCOs, Micro- Finance institutions and insurance companies that have adopted these innovations. Thus the researcher recommends that a similar study be conducted especially on how mobile banking has impacted on the financial performance of other financial institutions for comparison of results.

The financial sector is continuously seeking to ensure financial deepening and inclusion in the country. The study therefore recommends that another study be conducted in Kenya to establish whether the existence of mobile banking have enhanced financial deepening among the unbanked population in Kenya.

The study can also be replicate in other sectors or industries that have adopted such innovations; not only in Kenya but also in other countries within the East African region who are also highly adopting similar innovations; this would help in drawing a clear conclusion on the relationship between these variables.

There are several innovations that are currently being adopted by the bank; other than mobile and internet banking, a number of banks have also adopted the agency banking model. In this regard, the study suggests that another study be conducted on the effect of agency banking on either financial performance of the commercial banks or on financial deepening in Kenya.

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## APPENDICES

### Appendix 1: List of commercial Banks in Kenya as at 31st December 2013

1. African Banking Corporation Ltd.
2. Bank of Africa Kenya Ltd.
3. Bank of Baroda (K) Ltd.
4. Bank of India
5. Barclays Bank of Kenya Ltd.
6. CFC Stanbic Bank Ltd.
7. Chase Bank (K) Ltd.
8. Commercial Bank of Africa Ltd.
9. Consolidated Bank of Kenya Ltd.
10. Co-operative Bank of Kenya Ltd.
11. Credit Bank Ltd
12. Citibank N.A.
13. Development Bank of Kenya Ltd.
14. Diamond Trust Bank Kenya Ltd.
15. Dubai Bank Kenya Ltd.
16. Ecobank Kenya Ltd
17. Equatorial Commercial Bank Ltd.
18. Equity Bank Ltd
19. Family Bank Limited
20. Fidelity Commercial Bank Ltd
21. Fina Bank Ltd
23. Giro Commercial Bank Ltd.
24. Guardian Bank Ltd
25. Gulf African Bank Limited
26. Habib Bank A.G Zurich
27. Habib Bank Ltd.
28. Imperial Bank Ltd
29. I & M Bank Ltd
30. Jamii Bora Bank Limited.
31. Kenya Commercial Bank Ltd
32. K-Rep Bank Ltd
33. Middle East Bank (K) Ltd
34. National Bank of Kenya Ltd
35. NIC Bank Ltd
36. Oriental Commercial Bank Ltd
37. Paramount Universal Bank Ltd
38. Prime Bank Ltd
39. Standard Chartered Bank Kenya Ltd
40. Trans-National Bank Ltd
41. UBA Kenya Bank Limited
42. Victoria Commercial Bank Ltd
43. Housing Finance Ltd

22. First community Bank Limited

**Source: (Central Bank of Kenya)**