THE EFFECT OF FINANCIAL INNOVATIONS ON GROWTH OF COMMERCIAL BANKS IN KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted for a degree in any other University.

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DEDICATION

To my wife Gift Lilian Otiato and friend Joshua Ng'ang'a Wainaina who continue to inspire me throughout my work.

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LIST OF ABBREVIATIONS

ATM	Automated Teller Machine
ATMIA	ATM Industry Association
CBK	Central Bank of Kenya
CDO‘s	Collateralized Debt Obligations
ROA	Return on Assets
US	United States

ABSTRACT

The purpose of the study was to establish effects of financial innovations on growth of commercial banks in Kenya. Specifically the study sought to establish the effects of mobile banking, online banking, automated cheques clearing and agency banking on growth of commercial banks in Kenya. This study adopted descriptive design. The population of study consisted of all the licensed commercial banks that were registered with Central Bank of Kenya by December 2012. The study adopted a census study approach since the population was small and the institutions were easily assessable to be reached, hence the sample size was all commercial banks. The study collected secondary data only; these data included past and immediate income statements, statements of the financial position, cash flow statements, budget records, books and other publications in relation to banking industry in Kenya. Data collected was from financial year 2007 to 2012. A multiple regression model was adopted to establish the form of relationship between growth and the financial innovations.

The study found out that majority of the banks had adopted mobile banking and online banking while a number of banks had adopted automated cheques clearing and agency banking which have been one of the recent innovations among commercial banks in Kenya. Financial innovation lowers the transaction cost of transferring funds. It was concluded that adoption of the financial innovations had improved commercial banks growth and improved their operations and earnings. Financial innovations not only increased their market coverage but also improved their liquidity and also enabled them to remain competitive in the market especially in the current turbulent business environment.

The study recommends that there is need for commercial banks to adopt new financial innovations since this has provided the benefit of constant access to certain core services without necessarily visiting the banking hall. There is also need to adopt financial innovations to improve liquidity in banks. The study had shown that commercial banks that had adopted financial innovations had improved their liquidity. Adoption of financial innovations enables operational efficiency of commercial banks through making financial services more available and at reduced costs.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The Global Financial Crisis of 2007 to 2009 has spurred renewed wide-spread debates on the "bright" and "dark" sides of financial innovation (Laeven, *et al;* (2011). The traditional innovation-growth view posits that financial innovations help reduce agency costs, facilitate risk sharing, complete the market, and ultimately improve allocation efficiency and economic growth, thus focusing on the bright side of financial innovation. The innovation-fragility view, on the other hand, focuses on the "dark" side and has identified financial innovations as the root cause of the recent Global Financial Crisis, by leading to an unprecedented credit expansion that helped feed the boom and subsequent bust in housing prices (Brunnermeier, 2009), by engineering securities perceived to be safe but exposed to neglected risks (Gennaioli, Shleifer and Vishny, 2012), and by helping banks and investment banks design structured products to exploit investors' misunderstandings of financial markets (Henderson and Pearson, 2011).

History shows that financial innovation has been a critical and persistent part of the economic landscape over the past few centuries. In the years since Miller's 1986 piece, financial markets have continued to produce a multitude of new products, including many new forms of derivatives, alternative risk transfer products, exchange traded funds, and variants of tax-deductible equity. A longer view suggests that financial innovation, like innovation elsewhere in business, is an ongoing process whereby private parties experiment to try to differentiate their products and services, responding to both sudden and gradual changes in the economy (Obay, 2000).

1.1.1 Financial Innovation

Frame and White (2004) define financial innovation as "something new that reduces costs, reduces risks or provides an improved product/service/instrument that better satisfies participants' demands…" within a financial system. Innovations can emerge due to technological changes, as well as a response to increased risk or to new regulations.

When defining financial innovation the usual approach is to categorize it into three groups, according to where innovations occur.

According to Turfano (2003), financial innovation is the continuous development of new products, services, and technology to deliver services and products. Financial innovation is the catalyst behind the evolving financial services, industry and restructuring of financial markets. It represents the systematic process of change in instruments, institutions, and operating policies that determine the structure of financial system. McConnel and Shwarch (1992) state that innovations take the form of new securities, and financial markets, new products and services, new organizational forms, and new delivery systems. Financial innovation is about change, an ever –present feature of a bank life, it is not how many ideas there are but how many ideas are implemented (Gitonga, 2003).

In response to tight regulations imposed by the regulators the banks have come up with new services, products, and technologies to circumvent the government's regulations and in return the government introduces more regulations to counter the new discoveries. Kane (1984) describes this process of avoiding regulations as "loophole mining". The economic analysis of innovation suggests that when the economic constraints change such that regulations are made by avoiding them, loophole mining and innovation are more likely to occur.

1.1.2 Growth of Commercial Banks

Growth is the process of improving some measure of an enterprise's success. Business growth can be achieved either by boosting the top line or revenue of the business with greater product sales or service income, or by increasing the bottom line or profitability of the operation by minimizing costs. Any firm whose business generates significant positive cash flows or earnings, which increase at significantly faster rates than the overall economy. A growth company tends to have very profitable reinvestment opportunities for its own retained earnings (Sørensen, 2012).

Most studies examining innovativeness (e.g.Buzzell and Gale, 1987) have used profitability or growth as overall performance measures, without differentiating their

relationship. A wide variety of researchers in strategy literature have used growth as either a sole measure of firm performance or in combination with profitability. For example, Varaiya, Kerin, and Weeks (1987) reported that profitability and growth influenced shareholder value, without differentiating profitability from growth. Woo, Willard, and Daellenbach (1992) studied sales growth, ROA, and market-to-book ratios, respectively, but did not investigate their relationship.

1.1.3 Effects of Financial Innovation on Growth of Commercial Banks

The innovation-fragility view has focused more on the dark side of financial innovation. Financial innovations such as securitization change the ex-ante incentives of financial intermediaries to carefully screen and monitor the borrowers (Allen and Carletti, 2006).Wagner (2007) shows that financial innovation that reduces asymmetric information can actually increase risk-taking due to agency problems between bank owners and managers, or because of lower costs of fragility. In the context of the recent lending boom and subsequent Global Financial Crisis, several authors have pointed to distortions introduced by financial innovations, such as securitization and new derivative securities, and how they have contributed to aggressive risk taking, reduction in lending standards and thus fragility (Keys et al., 2010; Dell'Ariccia, Igan, and Laeven, 2008; and Gennaioli, Shleifer andVishny, 2012).

Henderson and Pearson (2011) provide evidence that financial innovations help banks and investment banks design structured products to exploit investors' misunderstandings of financial markets. Also related to this argument, Houston et al. (2011) find that regulatory arbitrage incentives play a very important role in determining cross border bank activities and international bank flows. Financial innovation driven by regulatory arbitrage should not improve economic growth or resource allocation, but rather increase financial fragility and economic volatility.

1.1.4 Commercial Banks in Kenya

In Kenya, the Banking Sector is composed of the Central Bank of Kenya, as the regulatory authority and the regulated; Commercial Banks, Non-Bank Financial Institutions and Foreign exchange Bureaus. As at December 2012 Kenya had 43 licensed

commercial banks and 1 mortgage finance company (www.centralbank.go.ke/). Out of the 44 institutions, 31 are locally owned and 13 are foreign owned.

Kenya's banks like other organizations are open systems operating in a turbulent environment; their continued survival depends on the ability to secure a "fit" with the environment (Pearce and Robinson 1997, Thompson and Strickland 1996). There have been significant developments in the structure of the Kenyan financial services sector in the past one decade. Until the early 1990s functional demarcation was predominant with many regulatory restrictions imposed and poor economic growth, one main consequence being limited competition both domestically and internationally. As a result there was heavy reliance on traditional branch-based delivery mechanisms in retail banking, with little pressure for change (CBK, 2008).

Over the last few years, the Banking sector in Kenya has continued to growth in assets, deposits, profitability and products offering. The growth has been mainly underpinned by; an industry wide branch network expansion strategy both in Kenya and in the East African community region and automation of a large number of services and a move towards emphasis on the complex customer needs rather than traditional 'off-the-shelf' banking products. Players in this sector have experienced increased competition over the last few years resulting from increased innovations among the players and new entrants into the market (CBK, 2008).

1.2 Research Problem

The business environment has changed and it has been characterized by stiff competition among the players and the banking industry in Kenya is no exception. Competition amongst the commercial banks has pushed the banks towards becoming more innovative. Oloo (2004) asserted that banks have realized that to stay ahead of competitors they have to improve their existing products or come up with completely new innovations.

Since mid 1990, banks in Kenya have been carrying out financial innovation such; this has transformed banks into a one-stop shop. Financial innovations have led to reduction in risk, costs and have increased efficiency amongst the industry players. However,

according to the recent innovation-fragility view, financial innovation have a "dark" side and has identified financial innovations as the root cause of the recent Global Financial Crisis (Brunnermeier, 2009), which is a challenge to banks growth. Despite the benefits outlined, there is need to establish the effects of financial innovations in the Kenyan banking sector growth.

Some research studies have been conducted on financial innovations. Foreign studies include Henderson and Pearson (2011) who conducted a study to establish the dark side (setbacks) of financial innovation while Frame and White (2009) conducted a study on how technological change and financial innovations are diffused in banks. Locally, Mwangi (2007) carried out a study on Factors Influencing Financial Innovation of Companies listed at Nairobi Stock Exchange. Kamotho (2009) study on mobile phone banking usage experience observed that competition triggers innovation and creativity. Koech, (2009) looked at the role of E-Banking as an innovation on general service delivery and customer satisfaction. However, none of these studies looked at how financial innovations impacts on commercial banks growth bearing in mind that the new innovation-fragility view shows that financial innovations are the root cause of the recent financial crisis in most economies. This study therefore sought to fill that gap by investigating; do financial innovations affect the growth of commercial banks in Kenya?

1.3 Objectives of the Study

General objective of the study is to establish effects of financial innovations on growth of commercial banks in Kenya while specific objectives are to establish effects of mobile banking, online banking, automated cheques clearing and agency banking on growth of commercial banks in Kenya.

1.4 Value of the Study

The study findings were expected to be of great significant to stakeholders in the banking industry to make appropriate decisions towards adoption of financial innovation. They would understand the benefits and challenges of adopting innovations in their financial institutions. The study would be used by industry players like banks and other stakeholders to see where more innovations are needed so as to enhance their growth.

The study would be used by the government and industry regulators to understand the type of financial innovations in the banking industry and ensure that the regulations that exist cover all the innovations and no gaps exist. The study would show how creative thinking on the part of commercial banks in Kenya can lead to higher growth.

Future researchers and scholars may use the study findings as a source of reference for further research on the same area. Scholars would have a better understanding on the relationship between financial innovations and banks' performance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is concerned with the review of literature related to the study, the theoretical review and the conceptual framework. In the literature, it reviews other authors' works on financial innovations. The last section is the summary of the literature which pointed out the research gaps on the empirical studies done.

2.2 Theoretical Review

This section discusses the theories that were established by other researchers, authors and scholars and are relevant to financial innovations. The study specifically reviewed the Silber's constraint theory of innovation, Kane's theory and Merton's market efficiency theory of innovation.

2.2.1 Silber's Constraint Theory of Innovation

Silber (1975) attributes financial innovations to attempts by profit maximizing firms to reduce the impact of various types of constraints that reduces profitability. The theory points out that the purpose of profit maximization of financial institutions is the key reason of financial innovation. Silber notes that there are some restrictions (including external handicaps and internal handicaps such as organizational management) in the process of pursuing profit maximization .Although these restrictions not only guarantee the stability of management they reduce the efficiency of financial institution so the institutions strive to cast them off.

Silber defines the particular conditions that will enable the emergence of a financial innovation (dividing them into instruments and practices), such as the arrival or imposition of an exogenous constraint. He discerns two kinds of constraint: a possible reduction of firm's utility, hence a new tool is required to bring it back to its previous level of utility 'abnormally' high ('success innovation,) (Silber, 1975). He considers as the main historical causes of innovation by US banks as a response to a reduction of their utility or adversity innovation: the interest rate ceiling, where banks tried to endogenize

exogenous items of their balance sheet (Certificate of Deposit, Eurodollars and bank-related commercial paper); the decline in the markets for particular assets (introduction of long term loans from commercial banks during the 1930s); a declining growth rate of sources of funds (new products in order to attract new funds) and an increase of the risk of a particular asset or of all assets due to the economic environment (interest on the other hand, examples of 'success innovations' are the extensive use of cost reducing information technology and elaborate new finance theories in the financial sector and several new products designed to cope with the rising yield of assets in order to attract new funds, summarizing Silber's contribution in comparison with other contributions).

He proposes that the three possible ways a financial firm could innovate are: by endogenizing an exogenous item of the balance sheet, introducing an existing financial instrument from another country or industry into the firm's portfolio and thirdly as the mixture of the above two ways, taking the form of a modification of an existing instrument (Silber, 1975).

Research literature has shown that firms that are less profitable in their respective sector are disproportionately innovative. Moreover, their decrease in profitability, which can be attributed to external competition or government regulation, has provided these firms with the necessary motivation to innovate in a bid to increase profitability. This finding is consistent with the suggestion in the work of Silber that investment in innovation is a rational response to an unfavorable competitive position (Silber, 1975, 1983).

2.2.2 Kane’s Market Technology and Political Theory of Innovation

Kane (1984) sees financial innovation as an institutional response to financial costs created by changes in technology, market needs, and political forces, particularly laws and regulations. Kane refers to the interactive process of regulation that follows institutional avoidance and innovations as dialectical process.

Financial industry is special it has stricter regulations and financial institutions have to deal with these regulations in order to reduce the potential risks to the minimum.

An example of Kane's theory where an institution responds (or adapts) to the changes in its operating environment is the rise of the shadow banking system in the US. Economists believe the current financial crisis was triggered by the shadow banking system. This "parallel" banking system essentially caused the credit market to freeze, due to lack of liquidity in the banking system. These entities which make up the shadow banking system include hedge funds, "borrowed short-term in the liquid market and then purchased long-term, illiquid risky assets". Banks cannot operate in such a manner but since the existing legislations were only designed to regulate banks, investment vehicles like hedge funds came up with risky innovative techniques in a bid to minimize their operational costs.

2.2.3 Merton's Market Efficiency Theory of Innovation

Merton (1990) also provides a valuable rationale for financial innovation. His theory is based on the notion that financial innovations are motivated by forces designed to increase market efficiency and improve social welfare. Merton argued that the market is not perfect hence financial institutions must innovate to improve market efficiency.

According to Rene (2000) financial economists generally view the flow of funds to take advantage of investment opportunities and financial innovations as positive forces that makes markets more efficient, facilitate risk sharing and increase growth. Many have argued that capital flows and financial innovations lead to instability, crashes and other disasters especially the 1987 crash and the derivative disasters in the 1990's but Merton was not convinced that financial innovation was to blame for the crashes.

Merton (1990) gives three motivations for producing innovations namely, the creation of new financial structures that allow risk sharing, risk pooling and hedging as well as new financial structures for transferring resources, the improvement of economic efficiency and liquidity and reduction of agency costs.

2.3 Benefits of Financial Innovations

Merton (1992) lamented that financial innovations is viewed as the "engine" driving the financial system towards its goal of improving the performance of what economists call the "real economy" Merton (1992) cites the US national mortgage market, the

development of international markets for financial derivatives and the growth of mutual fund and investment industries as examples where innovations has produced enormous social welfare gains.

Financial innovations involving derivatives can improve efficiency by expanding opportunities for risk sharing, lowering transaction costs and reducing asymmetric information and agency costs (Merton, 1995). Financial innovations promote economic growth by allocating capital where it can be most productive.

Pianalto (2007) pointed out that innovations allow markets to craft specialized mortgage contracts and to transfer risks and financial innovations has clearly benefited consumers by driving down costs. The author pointed out that since 1985; initial fees for conventional mortgage loans have fallen from roughly 2.5 percent of loan balance to about 0.5 percent. Additionally, a combination of legal and financial innovations has brought a big increase in the number of players in the mortgage market, including brokers, underwriters, servicers and rating agencies. Another advantage noted by the author was choice. A few decades ago, people were offered one or two different mortgage products, but now they can choose from multiple instruments and payback structures. Finally customers benefit from faster loans decisions.

A research carried out by ATMIA (ATM Industry Association) in June 2007 identified ATMs as one of the financial innovations and the following benefits was associated with the ATM, it creates convenience to the society by providing cardholders with 24 hour access to their safely banked cash, increase in retail purchase outside banking hours, that is, cash from ATMS have extended shopping hours providing for greater sales, greater employment opportunities and greater convenience for today's highly mobile citizens.

Kihumba (2008) in the study on determinants of financial innovations and its effect on banks performance in Kenya found that, increase in customer service, market expansion and increased banks revenue were the most benefits derived from financial innovations. Others included reduction in the number of customers in the banking hall, reduction in operational costs and geographical expansion of banks.

2.4 Challenges of Financial Innovations

According to Koech (2009) customers do not always embrace new products and services. In the case of E-banking, customers at first were not interested in the product because they did not understand how it operates; they deemed it insecure and expensive. A survey of bankers by Grant Thornton consultants in 2009 found that two-thirds were concerned about the security of E-banking transactions. Half said their customers were, too. According to Levison (2005) many consumers are also concerned about viruses and privacy issues that can cause glitches in the e-banking system, which can cause delays and mass confusion.

The rapid pace of financial innovation creates challenges for policy makers, according to Jenkison (2008) existing regulatory frameworks are not sufficient to cover the new innovations such as collateralized debt obligations (CDO‘s) in the USA that led to an upsurge in the mortgage market. In Kenya the introduction of mobile money transfer raised a heated debate to whether the laws that existed covered it, if it was secure and if it was undermining the traditional banking set up where one needed an account to deposit or withdraw money from forcing the government to establish a task force to study the security of the money transfer service (www.cbk.co.ke).

Ho (2006) highlighted the challenges of financial innovation as that innovations can work against the policy effect of the transmission mechanism; for example, new financial instruments such as futures and options significantly increase the ability of economic agents to lock in current interest rates for future funding needs, countering fluctuations in the cost of finance, and improving the inter-temporal substitution of income streams. The increase in transactions of some innovation products (off balance sheet items) such as derivatives could make financial positions of financial institutions less transparent, causing surveillance of the movements in assets and liabilities more difficult. Innovative products could expose financial institutions to new risks. As a result, the quality of their assets may prove to be dubious and financial institutions may find themselves in an increasingly sensitive situation. High return but highly risky new financial products with

low credit ratings could be introduced into financial markets, posing a threat to the system stability.

Ackerberg and Gowrisankaran (2006) identify large fixed costs of bank adoption as the barrier to greater use of ACH transactions and thus the society's capturing the accompanying potential cost savings.

2.5 Empirical Studies

Various studies on financial innovation have been undertaken; most noted been Tufano (2002) survey on financial innovation from a wide variety of disciplines. Silber (1975) a, Kane (1984), Miller (1986), Merton (1990), came up with various theories trying to explain why financial innovation occurs.

Tufano, (1989) longitudinal study between 1974-1986 on Financial Innovation and first mover advantages. Whose datawas collected from a population of 1,944 publicly traded securities, and a sample of 58. With an aim of establishing whether investment banks that create new securities benefits by charging higher prices (underwriting charges) than imitators or by capturing large quantities. He concluded that investment banks that created new financial products did not charge higher prices in the period before imitative products appear and in the long run charges lower than rivals. However these innovators did underwrote more public offerings that they innovated, than did the imitating rivals. Overall, Tufano's results was not consistent with monopoly pricing of new securities issues by innovators, but rather with the presence of cost advantages that allow these institutions to capture market shares.

Miller (1992) and Finnerty (1992) in their studies on financial innovation found that financial innovations occur when banks try to relocate risk, increase liquidity, or circumvent regulatory constraints. Levine (1997) in his study on financial development and economic growth noted that financial innovation is crucial indeed indispensable, for sustainable economic growth.

Sullivan (2000) compares banks in the 10th Federal Reserve district that had transactional Internet websites as of the first quarter of 2000 to those that did not have such web-sites.

He finds the former to be significantly larger and located in areas with a more educated population and a higher population fraction in the 18 to 64 age group. Banks offering transactional Internet web-sites are also found to have higher non-interest expenses and higher non-interest income.

Furst, Lang, and Nolle (2002) analyze survey data on Internet banking as of the third quarter of 1999. Using logit models, they found that a bank's choice of adopting Internet banking is related to holding company affiliation, location in an urban area, higher fixed expenses, and higher non-interest income. Among banks that offer Internet-related services, a greater number of service offerings were positively related to bank size and the length of time offering Internet banking.

Mwangi (2007) carried out a study on Factors Influencing Financial Innovation of Companies listed at Nairobi Stock Exchange with **o**bjective of explaining the macro-environmental and micro-environmental factors influencing financial innovation in Kenya's securities market. He studied a population of all 48 companies listed on the Nairobi Stock Exchange in 2005. The study concluded that Kenyan laws protecting investors was the major factor influencing financial innovation. This result is similar to the finding by Frame and White (2002). Further, the research finding showed that unstable foreign exchange rates were the most important factor influencing financial innovation among market volatility factors. Mwangi also observed that the absence of automated trading systems as a technological factor was found to influence financial innovations regularly. Finally he argued that global financial competition and integration had an influence on financial innovation with increased financial competition amongst financial institutions influencing financial innovation the most.

Kihumba (2008), Gitonga (2003) and Nystrom (2001) in their studies identified competition and technology as the major drivers of financial innovations. Smith, Smithson and Willford (1990) document that the increase in volatility of interest rates, exchange rates and commodity prices draw a link between an increase in risk and financial innovations.

A study conducted by Kamotho (2009) on Mobile Phone Banking: usage experiences in Kenya**.** Across two main dominant mobile banking service providers- Safaricom and Zain - during the three year period 2006-2008, from inception with total outlets of 8000 agents. This number tripled compared to 876 branches and 1424 ATM for commercial banks (CBK, 2008). He observed that competition triggers innovation and creativity. Continuous innovation not only yield new products but rather promotes efficiency in the performance of activities. Hence lowering the transaction cost. This finding is corroborates that of Tufano (1989). Contrary to popular wisdom that mobile phone money services are meant for funds transfer and remittances, his findings concluded that 96% of the respondents used the M-banking service as form of funds storage.

Koech (2009) on her study on E-banking services in commercial banks identified E-banking as one of the financial innovations in Kenya, she identified the benefits of E-banking to include: saving time, and providing convenience to customers. She also identified security and cost concerns as the major challenges facing E-banking.

Frame &White (2009-10) categorizes financial innovations into three categories namely: new products and services; new production processes; and new organizational forms. Finnerty (1992) identified a list of over 60 securities innovations, organized by broad type of instrument. Berkowitz (1999-2000), Fender and Gibson (2001) and Kupiec (2000) presented a survey on stress testing and its short coming as a risk management tool used by financial institutions.

2.6 Summary of Literature Review

A review of the empirical studies shows that financial innovations have become part and parcel of the banking sector. Banks have really changed the way they do business in terms of their operations, the kind of products and services that they offer to their customers. Financial innovation occurs as a result of many reasons which include regulations and taxes imposed on the financial institutions by the governments through the central bank. Competition, technology, globalization, volatility of interest rates, commodity prices and exchange are other reasons why financial innovations occur.

Many benefits have been associated with financial innovation these includes economic growth, choice of many financial instruments to choose from, decrease in operation cost to the institution, reduction in fees and charges to customers, increase in the industry players, increase in revenue of the banks among others. There are also challenges associated with financial innovation these includes failure by customers to embrace the new products mainly because they don't understand the product. Policy makers also face challenges with the rapidly innovating financial system.

Although many studies have been done on financial innovation in many aspects; no notable study has been done in Kenya to effects of financial innovations on the growth of commercial banks in Kenya and this is what this study seeks to establish.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methodology adopted by the researcher in carrying out the study. The chapter presents the population that was studied, the methods used to sample it, the instruments used in data collection and procedures that were used in data analysis.

3.2 Research Design

This study adopted descriptive design. Descriptive research design portrays an accurate profile of persons, events, or situations (Robson, 2002). Surveys allow the collection of large amount of data from a sizable population in a highly economical way. It allows one to collect quantitative data, which can be analyzed quantitatively using descriptive and inferential statistics (Saunders et al., 2007). Therefore, the descriptive survey was deemed the best design to fulfill the objectives of this study. Robson (2002) points out that descriptive study portrays an accurate profile of persons, events or situation. Furthermore, Chandran (2004) states descriptive study describes the existing conditions and attitudes through observation and interpretation techniques. Descriptive research design is one of the best methods for conducting research in human contexts because of portraying accurate current facts through data collection for testing hypothesis or answering questions to conclude the study (Robinson 2002, Chandran 2004).

3.3 Study Population

A population is a group of individuals, persons, events, objects or items from which samples are taken for measurement, it is the group the investigator wishes to make inference from. According to Saunders (2003) the population is the full set of cases from which a sample is taken. The population of study consisted of all the licensed commercial banks (see appendix I) that were registered with Central Bank of Kenya by December 2012.

The study adopted a census study approach. According to Cooper & Schindler (2007) a census is feasible when the population is small and necessary when the elements are quite different from each other. When the population is small and variable, any sample we draw may not be representative of the population from which it is drawn. Therefore since the target population for this study was small and variable, it was appropriate for researcher to choose census method

3.4 Data Collection Procedures

Data collection is gathering empirical evidence in order to gain new insights about a situation and answer questions that prompt undertaking of the research (Flick, 1998). The study utilized secondary data only. Owing to the nature of the study, that is an in depth inquiry, secondary data was gathered. The secondary data provided information on financial statements which helped to analyze growth. The main sources of secondary data included past and immediate income statements, statements of the financial position, cash flow statements, budget records, books and other publications in relation to banking industry in Kenya. Secondary data was easily available and this saved on time and the information was standardized though past information was prone to changes in inflation and change in accounting standards. Data collected was from financial year 2007 to 2012.

3.6 Data Analysis

Analysis of data involved inspecting, cleaning, transforming and modeling data with the aim of highlighting useful information, suggesting conclusions and supporting decision making and all these were done after checking if the information used had common variables regardless of the bank taken. This was done through scrutiny so as to minimize the variations due to size, time individual bank had been into operation and level of risk faced by each bank. A multiple regression model was adopted whereby; growth was the dependent variable while independent variables of financial innovations were online banking, mobile banking, automated cheques clearing and agency banking.

3.6.1 Analytical Model

The general equation relating the dependent and independent variables took the following form;

$$Y = A + B_1 X_1 + BX_2 + B_3 X_3 + B_4 X_4 + \epsilon$$

Where; Y =growth, a=the intercept, B1, B2, B3, and B4 are constants to be determined for years 1 to 6 whileX1, X2, X3, and X4 represents financial innovation variables.

The Y's and X's are the data quantities gathered from the population in question and A and B's are unknown parameters (constants) to be estimated from the data. In this research however, the model is based on theories that were established by other researchers, authors and scholars and the parameters have the following definition of expressions.

The model is GTH = A+b1OB+b2MB+b3ACC+b4AB+e, where;

GTH =growth of commercial banks

OBS=online banking

MB= mobile banking

ACC = automated cheques clearing

AB=agency banking

The error term e is poised to be normally distributed. The regression coefficients b's (to be estimated) measures how many units of growth would change by a unit change in any other factors that might influence growth while A represents other factors which may affect firm's growth apart from stated ones in the model.

Growth, GTH was measured using total customers' deposits per annum. Online banking, OB and mobile banking, MB were measured using number of transactions and total deposits attributed to them per annum. Automated cheques clearing, ACC were measured using number of cheques cleared and total deposits attributed to ACC per annum while agency banking, AB was measured using the number of agents and total deposits attributed to AB per annum.

Data was analyzed using the SPSS statistical package since it is best suited for providing a means of establishing quantitative association between variables. Given that we were looking for the association between firm growth and financial innovation, linear regression was best suited to quantify the strength of the relationship. Data presentation was done by the use of charts, bar graphs, percentages and frequency tables for easy understanding. F-test was tested for joint significance of all coefficients and t-test for significance of individual coefficients.

VARIABLE	**DEFINITION**	**FORMULAR/MEASUREMENT**
GTH	Growth of Commercial Banks	Total customers' deposits per annum
OB	Online Banking	Number of transactions Total deposits for OB per annum
MB	Mobile Banking	Number of transactions Total deposits for MB per annum
ACC	Automated Cheques Clearing	Number of cheques cleared Total deposits for ACC per annum
AB	Agency Banking	Number of agents Total deposits for AB per annum

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

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 effects of financial innovations on growth of commercial banks in Kenya. The study used the secondary data which included the balance sheets and profit and loss accounts of the commercial banks for a period of five years.

4.2 Findings

A multivariate regression model was applied to determine the form of relationship between innovations such as online banking, mobile banking, automated cheques clearing and agency banking and the growth of commercial banks. The regression analysis was conducted for each year, from 2007 to 2012. The regression model is based on theories that were established by other researchers, authors and scholars and it is as follows:

GTH = A+ β 1**OB**+ β2**MB**+ β 3**ACC**+ β4**AB**+e,

Where; GTH = growth of commercial banks

OBS= online banking

MB= mobile banking

ACC = automated cheques clearing

AB= agency banking

Table 4.1 Model Summary- Year 2007

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.775(a)	0.600	0.545	0.31207

a Predictors: (Constant), online banking, mobile banking, automated cheques clearing, agency banking

Source: Research Findings

Adjusted R^2 is called the coefficient of determination and tells us how the growth of commercial banks (Dependent variable) in Kenya varied with (independent variables) online banking, mobile banking, automated cheques clearing, agency banking. From the regression model summary above, the value of adjusted R^2 is 0.545. This implies that online banking, mobile banking, automated cheques clearing, agency banking (independent variables) explained 54.5% of growth in commercial banks (dependent variable); the remaining 45.5% would be explained by other variables not included in the study.

Table 4.2 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.235	4	1.059	10.871	.000(a)
	Residual	2.824	38	0.097		
	Total	7.059	42			

a Predictors: (Constant), online banking, mobile banking, automated cheques clearing, agency banking

b Dependent Variable: Growth of commercial banks

Source: Research Findings

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 likelihood (probability) of giving a wrong prediction. Hence the regression model has a confidence level of 95%.

Table 4.3 Coefficients Results- Year 2007

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.821	0.604		4.673	0.000
Online banking	0.157	0.110	0.191	1.424	0.165
Mobile banking	0.332	0.067	0.717	4.946	0.000
Automated cheques clearing	0.084	0.072	0.155	1.162	0.055
Agency banking	0.034	0.106	0.040	0.322	0.049

a Dependent Variable: Growth of commercial banks

Source: Research Findings

From the regression analysis, the following regression equation was established:

$$Y = 2.821 + 0.157\mathbf{X_1} + 0.332\mathbf{X_2} - 0.084\mathbf{X_3} + 0.034\mathbf{X_4}$$

From the above regression model, holding online banking, mobile banking, automated cheques clearing, agency banking constant, growth of commercial banks would be 2.821. A unit increase in online banking would cause an increase in growth of commercial banks by a factor of 0.157, a unit increase in mobile banking would cause an increase in growth of commercial banks by a factor of 0.332, also a unit increase in agency banking would cause an increase in growth of commercial banks by a factor of 0.034 and a unit increase in automated cheques clearing would cause a increase in growth of commercial banks by a factor of 0.084.

The analysis further established that at there was a significant relationship between growth of commercial banks and mobile banking p=0.000 (<0.005) and Agency banking p=0.049 (<0.005).

Table 4.4 Model Summary- Year 2008

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.845(a)	0.714	0.697	0.257

a Predictors: (Constant), online banking, mobile banking, automated cheques clearing, agency banking

Source: Research Findings

The value of adjusted R^2 is 0.697. This implies that there was a variation of 69.7% of growth of commercial banks with the four financial innovations; that is (online banking, mobile banking, automated cheques clearing, agency banking)at a confidence level of 95%.

Table 4.5 ANOVA Results- Year 2008

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.718	4	2.930	44.231	0.000(a)
	Residual	4.703	38	.066		
	Total	16.421	42			

a Predictors: (Constant), online banking, mobile banking, automated cheques clearing, agency banking

b Dependent Variable: Growth of commercial banks

Source: Research Findings

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 likelihood (probability) of giving a wrong prediction. This therefore means that the regression model has a confidence level of above 95% hence high reliability of the results.

Table 4.6 Coefficients Results- Year 2008

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.116	0.186		0.623	0.535
Online banking	0.577	0.068	0.559	8.478	0.000
Mobile banking	0.157	0.043	0.257	3.676	0.000
Automated cheques clearing	0.052	0.024	0.139	2.115	0.038
Agency banking	0.008	0.001	0.505	7.097	0.000

a Dependent Variable: Growth of commercial banks

Source: Research Findings

From the data in the above, there is a positive relationship between growth of commercial banks with and the predictors; online banking, mobile banking, automated cheques clearing, agency banking. The established regression equation was

$$Y = 0.116 + 0.577\mathbf{X_1} + 0.157\mathbf{X_2} + 0.052\mathbf{X_3} + 0.008\mathbf{X_4}$$

From the above regression model, holding online banking, mobile banking, automated cheques clearing, agency banking constant, growth of commercial banks would be at 0.116. It was established that a unit increase in online banking would cause an increase in growth of commercial banks by a factor of 0.577; a unit increase in mobile banking would cause an increase in growth of commercial banks by a factor of 0.157 while a unit increase in automated cheques clearing and agency banking would cause an increase in growth of commercial banks by a factor of 0.052 and 0.008 respectively.

The study further established that there is a significant relationship between growth of commercial banks and the four financial innovations as shown; online banking ($p= 000<0.05$), mobile banking ($p= 000<0.05$), automated cheques clearing ($p=0.038<0.05$) and agency banking ($p= 000<0.05$).

Table 4.7: Regression Model- Year 2009

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.788a	0.621	0.538	0.846

Source: Research Findings

Table 4.7 shows that a correlation value of 0.788 was established which shows a high relationship between dependent and independent variables. This is also shown by a coefficient of determination value of 0.538. The determination coefficient value indicates that the regression line accounts for 53.8% of the total observations.

Table 4.8 Analysis of Variance (ANOVA)- Year 2009

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Regression	4.236	4	1.059	1.186	.001a
Residual	37.508	38	.893		
Total	41.745	42			

Source: Research Findings

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 likelihood (probability) of giving a wrong prediction.

Table 4.9: Regression Coefficients Year 2009

	Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	1.191	1.367		0.871	.000
Online banking	0.119	0.176	0.109	0.675	.003
Mobile banking	0.026	0.182	0.023	0.145	.046
Automated cheques clearing	0.399	0.273	0.246	1.461	.041
Agency banking	0.395	0.246	0.256	1.601	.057

a Dependent Variable: Growth of commercial banks

Source: Research Findings

The following regression analysis was obtained:

$Y = 1.191 + 0.119X_1 + 0.026X_2 + 0.399X_3 + 0.395X_4$

The model shows that when all variables are held at zero (constant), the value of growth of commercial banks would be 1.191. A unit increase in online banking would lead to a 0.119 increase in growth of commercial banks; a unit increase in automated cheques clearing would lead to a 0.399 increase in growth of commercial banks while a unit increase in agency banking would lead to a 0.395 increase in growth of commercial banks. This suggests that all the four financial innovations would increase growth of commercial banks. The study also established that there was a significant relationship between growth of commercial banks and three financial innovations as shown; online banking ($p= 0.003<0.05$), mobile banking ($p= 0.046<0.05$), automated cheques clearing ($p=0.041<0.05$).

Table 4.10 Model Summary- Year 2010

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.775(a)	0.600	0.566	0.53181

a Predictors: (Constant), online banking, mobile banking, automated cheques clearing, agency banking

Source: Research Findings

The Adjusted R^2which is the coefficient of determination shows a value of 0.566. This implies that, there was a variation of 56.6% of growth of commercial banks with the four financial innovations (online banking, mobile banking, automated cheques clearing, agency banking) at a confidence level of 95%.

Table 4.11 ANOVA- Year 2010

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	19.938	4	4.985	17.625	0.000(a)
Residual	13.292	38	0.283		
Total	**33.231**	**42**			

a Predictors: (Constant), online banking, mobile banking, automated cheques clearing, agency banking

b Dependent Variable: Growth of commercial banks

Source: Research Findings

Table 4.12 Coefficients Results Year 2010

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	Std. Error	Beta		
(Constant)	2.204	0.402		5.481	0.000
Online banking	0.550	0.094	0.652	5.832	0.000
Mobile banking	0.081	0.116	0.070	0.694	0.491
Automated cheques clearing	0.270	0.054	0.481	5.031	0.025
Agency banking	0.415	0.080	0.524	5.212	0.000

a Dependent Variable: Growth of commercial banks

Source: Research Findings

From the data in the above table 4.12, there is a positive relationship between growth of commercial banks and the financial innovations online banking, mobile banking, automated cheques clearing, agency banking. The following regression equation was established.

$$Y = 2.204 + 0.550\mathbf{X_1} + 0.081\mathbf{X_2} + 0.270\mathbf{X_3} + 0.415\mathbf{X_4}$$

From the above regression model, holding all financial innovations constant, growth of commercial banks would be 2.204; a unit increase in online banking would cause an increase in growth of commercial banks by a factor of 0.550; a unit increase in mobile banking would cause an increase in growth of commercial banks by a factor of 0.081,

also a unit increase in Agency banking would cause an increase in growth of commercial banks by a unit of 0.415 while a unit increase in automated cheques clearing would cause an increase in growth of commercial banks by a unit of 0.270.

The results show that there is a strong relationship between growth of commercial banks and financial innovations such as agency banking and online banking. The study further shows that there is significant relationship between growth of commercial banks and three financial innovations; online banking p=0.000 (<0.05), automated cheques clearing p=0.025 (<0.05), agency banking p=0.000 (<0.05).

Table 4.13 Model Summary for Year 2011

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.865(a)	0.748	0.619	4.605

a Predictors: (Constant), online banking, mobile banking, automated cheques clearing, agency banking

Source: Research Findings

Table 4.13 above shows the value of adjusted R^2 is 0.619. This implies that, there was a variation of 61.9% of growth of commercial banks with the four financial innovations (online banking, mobile banking, automated cheques clearing, agency banking) at a confidence level of 95%, in other words, the regression line accounts for 61.9% of the total observations.

Table 4.14: Coefficient's Results for Year 2011

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.918	1.715		3.133	0.000
	Online banking	0.200	0.063	.091	0.094	0.035
	Mobile banking	0.579	0.057	.095	0.093	0.028
	Automated cheques clearing	0.455	0.061	.094	0.092	0.018
	Agency banking	0.332	0.067	.093	0.091	0.013

a Dependent Variable: Growth of commercial banks

Source: Research Findings

The established regression equation for was

$$\mathbf{Y = 3.918 + 0.579\ X_1 + 0.200\ X_2 + 0.955\ X_3 + 0.332\ X_4}$$

Holding online banking, mobile banking, automated cheques clearing and agency banking constant, growth of commercial banks would be 3.918. It was further established that, a unit increase in online banking would cause an increase in growth of commercial banks by a factor of 0.200, a unit increase in mobile banking would cause an increase in growth of commercial banks by a factor of 0.579, also a unit increase in automated cheques clearing would cause an increase in growth of commercial banks by a factor of 0.455 while a unit increase in agency banking would cause an increase in growth of commercial banks by a factor of 0.332.

It can be observed that, that in the year 2011, there was a strong relationship between growth of commercial banks and mobile banking as indicated by a factor increase of 0.579. However, all the four financial innovations shown a significant relation with growth of commercial banks as shown; online banking p=0.035 (<0.05), mobile banking p=0.028 (<0.05), automated cheques clearing p=0.018 (<0.05), agency banking p=0.013 (<0.05).

Table 4.15: Regression Model Summary for the Year 2012

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.788a	0.621	0.542	0.468

a Predictors: (Constant), online banking, mobile banking, automated cheques clearing, agency banking

Source: Research Findings

A correlation value of 0.788 was established which shows a high relationship between dependent and independent variables. This is also shown by a coefficient of determination value of 0.542. The determination coefficient value indicates that the regression line accounts for 54.2% of the total observations.

Table 4.16 Analysis of Variance – ANOVA for the Year 2012

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Regression	4.236	4	1.059	1.186	0.001a
Residual	33.934	38	0.893		
Total	**38.170**	**42**			

Source: Research Findings

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 likelihood (probability) of giving a wrong prediction.

Table 4.17: Regression Coefficients for the Year 2012

	Unstandardized Coefficients		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	1.182	1.367		0.871	0.000
Online banking	0.203	0.176	0.109	0.675	0.026
Mobile banking	0.169	0.182	0.023	0.145	0.014
Automated cheques clearing	0.239	0.273	0.246	1.461	0.000
Agency banking	0.358	0.246	0.256	1.601	0.007

a Dependent Variable: Growth of commercial banks

Source: Research Findings

The study shows that, a unit increase in any of the above financial innovations would cause an increase in growth of commercial banks. The following regression analysis was obtained:

$\mathbf{Y} = 1.182 + 0.203X_1 + 0.169X_2 + 0.239X_3 + 0.358X_4$

The study further shows that there is a significant relationship between growth of commercial banks and the four financial innovations: online banking ($p = 0.026 < 0.05$), mobile banking ($p = 0.014 < 0.05$), Automated cheques clearing ($p = 0.000 < 0.05$), agency banking ($p = 0.007 < 0.05$).

4.3 Interpretation of Findings

In the Year 2007, the study established an Adjusted R^2 value of 0.545. This implies that online banking, mobile banking, automated cheques clearing, agency banking (independent variables) explained 54.5% of growth in commercial banks (dependent variable). It was found out that all the four financial innovations would increase growth in commercial banks and that there was a significant relationship between growth of commercial banks and mobile banking $p = 0.000$ (< 0.005) and Agency banking $p = 0.049$ (< 0.005).

In the year 2008, the value of adjusted R^2 is 0.697; thus there was a variation of 69.7% of growth of commercial banks with the four financial innovations; that is (online banking, mobile banking, automated cheques clearing, agency banking). It was established that there was a positive relationship between growth of commercial banks with and the financial innovations; online banking, mobile banking, automated cheques clearing, agency banking. The study found a significant relationship between growth of commercial banks and the four financial innovations as shown; online banking (p= 000<0.05), mobile banking p= 000<0.05), automated cheques clearing (p=0.038<0.05) and agency banking p= 000(<0.05).

In the years 2009, the value of adjusted R^2 was 0.538. The determination coefficient value indicates that the regression line accounts for 53.8% of the total observations. The study found out that all the four financial innovations would increase growth of commercial banks. There was a significant relationship between growth of commercial banks and three financial innovations as shown; online banking (p= 0.003<0.05), mobile banking p= 0.046<0.05), automated cheques clearing (p=0.041<0.05).

In the year 2010, the Adjusted R^2value was 0.566. This means that there was a variation of 56.6% of growth of commercial banks with the four financial innovations (online banking, mobile banking, automated cheques clearing, agency banking).There is a positive relationship between growth of commercial banks and the financial innovations online banking, mobile banking, automated cheques clearing, agency banking. The results show that there is a strong relationship between growth of commercial banks and financial innovations such as agency banking and online banking. The study further shows that there is significant relationship between growth of commercial banks and three financial innovations; online banking p=0.000 (<0.05), automated cheques clearing p=0.025(<0.05), agency banking (p=0.000<0.05).

In the year 2011, the value of adjusted R^2 was 0.619, thus there was a variation of 61.9% of growth of commercial banks with the four financial innovations (online banking, mobile banking, automated cheques clearing, agency banking).There was a strong relationship between growth of commercial banks and mobile banking as shown by a beta coefficient of 0.579. Moreover, all the four financial innovations shown a significant

relation with growth of commercial banks as shown; online banking p=0.035 (<0.05), mobile banking p=0.028 (<0.05), automated cheques clearing p=0.018 (<0.05), agency banking p=0.013(<0.05).

In the year 2012, A correlation value of 0.788 was established which shows a high relationship between dependent and independent variables while the adjusted R^2 was 0.542 which shows that the regression line accounts for 54.2% of the total observations. The study further found out that, a unit increase in any of the above financial innovations would cause an increase in growth of commercial banks. There is also a significant relationship between growth of commercial banks and the four financial innovations: online banking (p= 0.026<0.05), mobile banking (p=0.014<0.05), automated cheques clearing (p=0.000<0.05), agency banking (p=0.007<0.05).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the findings; the conclusion and the recommendations of the study which sought to establish effects of financial innovations on growth of commercial banks in Kenya.

5.2 Summary

The study established that majority of the banks had adopted mobile banking and online banking while a number of banks had adopted automated cheques clearing and agency banking which has been one of the recent innovations among commercial banks in Kenya. Financial innovation lowers the transaction cost of transferring funds. Therefore financial innovation attempts to minimize risk and maximize return through improved financial process created as a result of innovation. The development of new technology stimulates financial innovation by lowering the cost of providing new financial services and instruments. The study established that financial innovations are very important in the improvement of commercial banks growth.

An analysis on the relationship between the financial innovations and growth of commercial banks established that, there was a positive relationship between mobile banking, online banking, automated cheques clearing and agency banking. The study found out that financial innovations improved the growth of commercial banks in terms of deposits made. Majority of the commercial banks studied revealed that there was increased growth of deposits and earnings from the year 2007 to 2012. The reported earnings and deposits growth in over the period covered can be attributed to these financial innovations.

5.3 Conclusion

It can be concluded that adoption of these financial innovations had improved commercial banks growth and further improved their operations and earnings. The financial innovations are not only adopted to increase their market coverage but also to

improve the liquidity and also remain competitive in the market in the current turbulent business environment.

Majority of commercial banks in Kenya have vested their resources especially in introducing or innovation new products and technological innovations such as mobile banking, online banking, automated cheques clearing and agency banking. These technological innovations had helped the banks in carrying out business activities more effectively and efficiently. Moreover, financial innovations contribute to improved performance as observed by the trend in terms of growth for the last five years since the banks adopted the financial innovations.

However, the study established that some innovations such as automated cheques and agency banking were only common among the first tier banks while the small banks were yet to adopt such innovations; which may be might be attributed to lack of enough funds/ resources required to adopt such innovations as some of these innovations requires large resources as well as expertise.

5.4 Policy Recommendations

Based on the findings and conclusions of the study the following recommendations have been suggested in relations to financial innovations. There is need for commercial banks in to adopt new financial innovations since this has provided the benefit of constant access to certain core services reducing the need to interact with bank staff for many people. Technological innovations by the banks have prompted agreements to share systems through between banks and the development of cash points being installed in non-branch locations such as supermarkets; this means that a proportion of a particular bank's customer base may no longer use the bank's branch network at all.

Like many businesses turnover in banks is chased, profits are generated but cash is short. Hence there is need to adopt financial innovations to improve liquidity in banks. The study had shown that commercial banks that had adopted financial innovations had improved their liquidity. Adoption of financial innovations enables operations of commercial banks to more efficient through making financial services more available and at reduced costs.

Allotting large sums of capital to financial innovation in banks will not only make it possible to provide the inputs required for innovation, but will also allow the bank to absorb the costs of innovation, as well as the costs arising from potential failures and thus will enable the bank to take more first mover initiatives in product/service and process innovation. The researcher recommends that banks seeking to improve their efficiency should increase their first mover initiatives in process innovation. Some financial innovations decrease risk and volatility associated with globalizing markets. With greater globalization, commercial banks are exposed to new risks such which financial innovations seek to manage.

5.5 Limitations of the Study

In conducting the study, the researcher encountered a number of challenges. One of the challenges was lack of cooperation from some of the banks who were unwilling to give information. This study was dependent on financial statements and records from commercial banks but some banks were unwilling to give such information. However, the researcher explained to the banks authorities that the sought information was just for academic purposes and would not be released to third party.

Another limitation was that, majority of the small banks, though they formed part of the sample size, some had not adopted some of the financial innovations such as agency banking and online banking unlike the banks in the first tire. This limited the information/ data collected from these banks and could not therefore form a clear comparison on the effect of financial innovations on growth of small and larger banks.

The third challenge was limitation of information given by the banks. Some banks were secretive or rather limited the information they gave out. Some of the information such as number of transactions recorded, amount of deposits from specific transactions was not given. Some of this information was crucial for the study to make a formidable conclusion

5.6 Areas for Further Research

This study was concerned with financial innovation on growth of commercial banks in Kenya. However, financial innovations are being adopted in various financial institutions. Therefore, future studies should look at other institutions in the financial sector that have adopted financial innovation such as insurance companies and micro finance institutions for comparison of results.

This study depended solely on secondary data. The study recommends that future studies could also gather primary data from the staffs and the management so as to get their opinion and a better picture on the effects of financial innovations on growth or performance.

The study found out that there has been increased adoption of financial innovations by the financial institutions. The researcher recommends that a further research should be conducted to establish the factors influencing adoption or the determinants of adoption of financial innovation among financial institutions in Kenya. The study should investigate both the internal and external factors influencing financial innovation adoption and the challenges thereof.

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APPENDICES

Appendix I: List of Commercial Banks

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. Charterhouse Bank Ltd
8. Chase Bank (K) Ltd.
9. Citibank N.A Kenya
10. Commercial Bank of Africa Ltd.
11. Consolidated Bank of Kenya Ltd.
12. Co-operative Bank of Kenya Ltd.
13. Credit Bank Ltd.
14. Development Bank of Kenya Ltd.
15. Diamond Trust Bank Kenya Ltd.
16. Dubai Bank Kenya Ltd.
17. Ecobank Kenya Ltd
18. Equatorial Commercial Bank Ltd.
19. Equity Bank Ltd.
20. Family Bank Limited
21. Fidelity Commercial Bank Ltd
22. Fina Bank Ltd
23. First community Bank Limited
24. Giro Commercial Bank Ltd.
25. Guardian Bank Ltd
26. Gulf African Bank Limited
27. Habib Bank A.G Zurich
28. Habib Bank Ltd.

29. Imperial Bank Ltd
30. I & M Bank Ltd
31. Jamii Bora Bank Limited.
32. Kenya Commercial Bank Ltd
33. K-Rep Bank Ltd
34. Middle East Bank (K) Ltd
35. National Bank of Kenya Ltd
36. NIC Bank Ltd
37. Oriental Commercial Bank Ltd
38. Paramount Universal Bank Ltd
39. Prime Bank Ltd
40. Standard Chartered Bank Kenya Ltd
41. Trans-National Bank Ltd
42. UBA Kenya Bank Limited
43. Victoria Commercial Bank Ltd

Source: Central Bank of Kenya (CBK), 2012

Appendix II: Summary of Regression Results

Year/Variables	Beta Co-efficient	Sign. (P Value)
Year 2007		
Constant	2.821	0.000
Online banking	0.157	0.165
Mobile banking	0.332	0.000
Automated cheques clearing	0.084	0.055
Agency banking	0.034	0.049
Year 2008		
Constant	0.116	0.535
Online banking	0.577	0.000
Mobile banking	0.157	0.000
Automated cheques clearing	0.052	0.038
Agency banking	0.008	0.000
Year 2009		
Constant	1.191	0.000
Online banking	0.119	0.003
Mobile banking	0.026	0.046
Automated cheques clearing	0.399	0.041
Agency banking	0.395	0.057
Year 2010		
Constant	2.204	0.000
Online banking	0.550	0.000
Mobile banking	0.081	0.491
Automated cheques clearing	0.270	0.025
Agency banking	0.415	0.000
Year 2011		
Constant	3.918	0.000
Online banking	0.200	0.035
Mobile banking	0.579	0.028

Automated cheques clearing	0.455	0.018
Agency banking	0.332	0.013
Year 2012		
Constant	1.182	0.000
Online banking	0.203	0.026
Mobile banking	0.169	0.014
Automated cheques clearing	0.239	0.000
Agency banking	0.358	0.007

Appendix III: Audited Financial Statements

PROFIT AND LOSS ACCOUNT	**Totals**	**AVERAGE**
	Shs. 000	**Shs. 000**
INTEREST INCOME		
1.1 Loans and advances	79,374,772	1,841,963
1.2 Government securities	20,425,007	474,890
1.3 Deposits and placements with banking institutions	5,983,990	138,854
1.4 Other	1,876,717	43,645
1.5 Total Interest income	**107,660,486**	**2,499,352**
INTEREST EXPENSES		
2.1 Customer deposits	27,122,727	630,464
2.2 Deposits and placements from banking institutions	2,813,603	65,409
2.3 Other	1,896,471	44,104
2.4 Total interest Expenses	**31,832,802**	**739,977**
NET INTEREST INCOME	**5,827,684**	**1,759,375**
OTHER OPERATING INCOME		
4.1 Fees and commissions income on loans & advances	10,249,524	238,361
4.1 Other Fees and commissions income	22,224,815	515,456
4.2 Foreign exchange trading income	13,292,019	308,373
4.3 Dividend Income	70,717	1,645
4.4 Other income.	6,020,417	140,010
4.5 Total Non-Interest Income	**51,857,492**	**1,203,844**
TOTAL OPERATING INCOME	**127,685,176**	**2,963,219**
OPERATING EXPENSES		
6.1 Bad and doubtful debts expenses	10,694,391	246,211
6.2 Staff costs		822,777

	35,432,555	
6.3 Directors' emoluments	1,077,234	24,763
6.4 Operating lease rental	3,598,597	83,322
6.5 Depreciation on property and equipment	4,590,152	106,476
6.6 Ammortisation charges	702,153	16,304
6.7 Other operating expenses	26,781,924	621,472
6.7 Total Operating Expenses	**82,877,007**	**1,921,324**
Profit/(loss) before tax and exceptional items	**44,808,170**	**1,041,894**
Exceptional items	(9,224)	(355)
Profit/(loss) before tax	**44,798,946**	**1,041,540**
Finance Cost	-	-
Share of associate profit	14,992	577
Profit before tax	**44,783,954**	**1,040,963**
Current tax	(13,101,913)	(304,595)
Deferred tax	683,400	15,873
Minority Interest	-	-
Profit / (loss) after tax	**32,365,441**	**752,241**
AUDITED FINANCIAL STATEMENTS		
I BALANCE SHEET	**Totals**	
A. ASSETS	**Shs. 000**	
1. Cash (both Local & foreign)	30,950,249	717,167
2. Balances due from central of Kenya	65,660,835	1,526,223
3. Government securities	181,165,577	4,213,153
4. Foreign Currency Treasury Bills and Bonds		174,265

	7,493,401	
5. Deposits and balances due from banking institutions	32,916,644	760,341
6. Deposits and balances due from banking institutions abroad	87,851,506	2,041,763
7. Government and other securities held for dealing purposes	33,415,066	775,716
8. Interest receivable and other assets	-	-
9.Tax recoverable	350,096	8,142
10. Loans and advances to customers (net)	669,721,681	15,552,661
11. Investment securities	4,041,054	93,978
12. Balances due from group companies	38,250,926	889,556
13. Investments in associates	2,074,817	48,252
14. Investments in subsidiaries	110,965	2,581
15. Investment properties	1,110,758	25,832
16. Property and equipment	34,258,322	795,813
17. Intangible assets	6,202,131	144,138
18. Prepaid Operating Lease	1,720,473	40,011
19. Deferred tax asset	3,392,197	78,888
20. Retirement benefit asset	2,020,309	46,984
21. Other assets	35,577,957	823,743
19.TOTAL ASSETS	**1,238,284,965**	**28,759,205**
B. LIABILITIES		
19. Customer deposits	912,079,801	21,187,163
20. Deposits and balances due to Local banking institutions	29,055,036	675,699
20. Deposits and balances due to Foreign banking institutions	39,732,170	924,004
21. Balances due to Central Bank of Kenya	106	2

22. Other money market deposits	195,806	4,554
23. Borrowed funds	17,140,071	398,606
24. Balances due to group companies	22,219,513	516,733
25. Interest payable and other liabilities	51,164	1,190
26. Tax payable	2,830,434	65,789
27. Proposed dividends.	117,189	2,725
28. Deferred tax liability	677,010	15,743
29. Retirement benefit liability	169,612	3,944
34. Other liabilities	44,099,125	1,021,029
30. TOTAL LIABILITIES	**1,068,367,036**	**24,817,181**
C. SHAREHOLDERS' EQUITY	-	-
31. Paid up/Assigned capital	53,806,252	1,242,881
32. Share premium	35,202,263	818,657
33. Revaluation reserve	3,827,876	89,020
revalution reserve available for sale securities	(247,163)	(5,748)
34. Retained earnings	60,568,096	1,407,777
35. Proposed dividends	8,463,365	196,822
42. Capital grants	1,617,351	37,613
36. Translation reserves	40,150	934
37. Statutory loan reserve	4,643,633	107,647
38. Fair value reserve	-	-
39. Shareholders loans/grants	-	-
40. TOTAL SHAREHOLDERS' EQUITY	**167,921,823**	**3,895,603**

41. Minority Interest	1,996,108	46,421
42.TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	**1,238,284,967**	**28,759,205**
OTHER DISCLOSURES	**Totals**	
BANKS		
1) NON PERFORMING LOANS AND ADVANCES		
a) Gross non performing loans and advances	63,127,978	1,452,099
Less	-	-
b) Interest in suspense	13,822,847	315,822
c) Total Non-Performing loans and advances (a-b)	**49,305,131**	**1,136,278**
Less	-	
d) Loan loss provision	26,052,372	599,239
e) Net non- performing loans(c-b)	23,252,759	537,038
f) Realisable value of securities	22,279,241	514,398
g) Net NPLs Exposure (e-f)	**973,518**	**22,640**
f) General Provision for loans and advances	-	
g) Total provisions for Loans and Advances	-	
2)INSIDER LOANS AND ADVANCES	-	
a) Directors, shareholders and associates	12,103,247	279,456
b)Employees	19,680,581	457,542
c) Total insider Loans and Advances and other Facilities	**31,783,828**	**736,998**
3)OFF BALANCE SHEET ITEMS	-	
a) Letter of Credit, guarantees, acceptances	159,942,842	3,711,581
b) Other contigent Liabilities	260,160,545	6,050,245

c) Total contigent Liabilities	**420,103,387**	**9,761,827**
4) CAPITAL STRENGTH	-	
a) Core Capital	142,078,106	3,294,931
b) Minimum statutory capital	11,000,000	250,000
c) Excess/ (defficiency)	131,078,106	3,044,931
d) Supplementary capital	17,290,580	401,762
e) Total Capital (a+d)	**159,368,686**	**3,696,693**
f) Total Risk Weighted Assets	779,617,372.12	18,094,552
g) Core Capital/ Total Deposit Liabilities	24%	24%
h) Minimum statutory ratio	8%	8%
i) Excess / (defficiency) (g-h)	17%	17%
j) Core Capital/ Total Risk Weighted Assets	25%	25%
k) Minimum statutory Ratio	8%	8%
L) Excess / (defficiency) (j-k)	17%	17%
m) Total Capital/ Total Risk Weighted assets	26%	26%
n) Minimum statutory Ratio	12%	12%
o) Excess / (defficiency) (m-n)	15%	15%
5) LIQUIDITY		
a) Liquidity Ratio	43%	43%
b) Minimum statutory Ratio	20%	20%
c) Excess / (defficiency) (a-b)	23%	23%
Capital Ratios		
Core Capital/ Total Deposit Liabilities	24.47	24.47
Core Capital/ Total Risk Weighted Assets	25.34	25.34
Total Capital/ Total Risk Weighted assets	26.36	26.36
Assets Quality		
NPL Provision/Operating income	37.08	36.75
Non performing portfolio/Gross portfolio	8.61	8.54
Loans to Deposits Ratio	80.35	80.26
Charge for bad & doubtful debts/ Gross advances	1.95	1.93

Specific Provision/Gross Advances	5.44	5.38
Insider Loans/Total Loans & Advances	2.69	2.69
Profitability Ratios		
Return on Assets (Before Tax)	4.82	4.83
Return on Assets (After Tax)	3.48	3.49
Return on Equity (Before Tax)	35.56	35.63
Return on Equity (After Tax)	25.70	25.75
Efficiency Ratios		
Cost to Income Ratio	64.91	64.84
Operating cost/ Loan Portfolio	16.50	16.47
Operating cost/ Assets	8.92	8.91
Staff cost / Loan portfolio	7.27	7.27
Staff cost / Assets	3.93	3.93
Earning Assets to Total assets	87.40	87.41
Net Interest Income / Total Assets	8.16	8.16
Non Interest Income to Total Assets	5.58	5.58
Non interest Income to Total Income	40.61	40.63
Operating Income to Total assets	13.75	13.74
Non Interest Income to Total Non Earning Assets	44.32	44.33
Liquidity Ratios		
Liquidity	43.46	43.46
Cash to Deposits Ratio (C/D Ratio)	3.16	3.15
Other Balance Sheet Ratios		
Non Earning Assets to Total Assets	12.60	12.59
Government securities to Total Assets	14.63	14.65

Loans to Total assets	54.08	54.08
Net Fixed assets/core capital	28.48	28.53
Net Fixed assets/Total Assets	3.27	3.27
Yields Ratios		
Yield on Loans	15.80	15.79
Yield on Earning Assets	13.26	13.26
Yield on Government Securities	15.03	15.03
Margin Ratios		
Effective Cost of Deposits	3.96	3.97
Effective Cost of Funds	4.43	4.43
Interest Spread	8.84	8.83
Net Interest Margin	10.29	10.28
Other Income Ratios		
Income from Govt Securities to Total Net interest income	26.94	26.99
Income from Govt Placement to Total Net interest income	7.89	7.89
Forex Income to Total Non funded income	25.63	25.62
Cash / Total Assets	7.80	7.80
Deposits / Total funding	543.16	73.67
Gross Nonperforming Loans/Loans Outstanding	9.43	9.34
Charge for bad & doubtful debts/gross advances	1.95	1.93
Allowance for Loan Losses/Loans Outstanding	3.89	3.85
Interest Margin (Annualized)	9.34	9.33
Return on Average Equity (After Tax)	25.70	25.75
Return on Average Assets (After Tax)	3.48	3.49
Net Interest income/Average Total assets	8.16	8.16
Non-interest income/ Ave Total Assets	5.58	5.58
Cost of funds	3.96	3.97
Total effective Yields on Loans	15.80	15.79
INTEREST SPREAD	5.38	5.36
Operating income/ave assets	13.75	13.74
Staff & Directors costs / Loan Portfolio	7.27	7.27

Staff & Directors costs/ Assets	3.93	3.93
Operating cost/ Loan Portfolio	16.50	16.47
Operating cost / Assets	8.92	8.91
Total cost to Ave. Total Assets	12.35	12.34

Appendix IV: Data for Specific Commercial Banks

Banks	**Profit / (loss) after tax**	**Customer deposits**
Barclays bank	5,524,802	126,407,913
Equity bank	3,910,283	50,334,525
Stan-Chart	3,250,813	76,898,456
KCB Bank	4,190,690	126,691,066
NIC Bank	1,037,681	35,238,381
Diamond Trust Bank	1,148,980	45,023,186
Savings & Loan (k) Ltd	320,697	4,504,397
Housing Finance	136,427	10,063,830
Victoria Bank	116,815	3,581,692
CFC Stanbic	1,732,920	61,528,658
Prime Bank	330,347	15,661,930
Co-operative Bank	2,373,638	65,853,725
CBA	1,319,484	44,802,789
Credit Bank	54,049	2,773,917
Consolidated Bank	96,223	3,278,716
Imperial Bank Ltd	465,687	10,414,043
National Bank	1,240,610	34,277,654
Guardian Bank	29,493	4,585,517

Trans National	132,414	1,890,623
Southern Credit	1,825	4,105,695
I & M Bank	1,113,678	34,420,747
Bank of Baroda	832,011	15,164,904
Fina Bank	97,878	11,470,439
Fidelity Bank	42,190	3,778,298
City Finance Bank	(3,215)	164,364
Giro Bank	80,157	5,127,130
Bank of Africa	218,349	13,820,055
Family Bank	366,740	7,404,069
Development Bank	118,491	2,200,329
Chase Bank	169,185	7,146,814
Paramount Bank	36,725	2,109,482
Bank of India	377,593	10,211,095
Citibank	1,874,901	31,191,803
Equatorial bank	7,435	3,667,533
ABC Bank	147,964	5,339,269
Oriental Bank	48,526	1,314,415
Ecobank	68,920	8,341,460
Habib AG Zurich	157,487	5,372,743
Middle East	17,994	2,021,179
K-Rep	(348,571)	4,501,753
Habib Bank	98,216	3,024,234
Dubai bank	3,239	1,031,794
Gulf Bank	(281,351)	3,248,533
First Community	(224,813)	2,090,646

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TO WHOM IT MAY CONCERN

The bearer of this letter .... JACKSON MAINA NJUGUNA

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is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.

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MBA ADMINISTRATOR
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