

**EFFECT OF FINANCIAL INNOVATION ON FINANCIAL PERFORMANCE OF
COMMERCIAL BANKS IN KENYA**

BY

NYAGA PATRICK GITONGA

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DECLARATION

This research project is my original work and has not been presented to any other examination body.

Nyaga Patrick Gitonga

.....

D61/72503/2014

Sign

Date

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

Sign

Date.....

Winnie Nyamute

Department of Finance and Accounting

School of Business

University of Nairobi

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DEDICATION

My loving family

Your unconditional love, support, encouragement is immeasurable.

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ABSTRACT

This study looks at the various forms of financial innovations that have continuously taken place in the provision of financial services in Kenya over a period of 4 years. Over a period of time Kenya has experienced continued growth in the adoption of various non-cash modes of payment hence the need for continuous studies to establish the effect of these financial innovations in the financial services sector. The objective of this study was to establish the effect of financial innovation on the financial performance of commercial banks in Kenya. The research adopted a descriptive design; census study was employed where all 43 commercial banks licensed by the central bank of Kenya as at 30th June 2014 were engaged. Secondary data was obtained from reports published by the central bank of Kenya (CBK), data was analyzed using statistical package for social sciences (SPSS). Descriptive statistics, Pearson correlation and multiple regression analysis methods were applied. The study found that there was strong positive correlation coefficient of 0.531 between the financial performance of commercial banks in Kenya and adoption of ATMS. The study also found that there is a strong positive correlation of 0.501 between financial performance of commercial banks in Kenya and transactions made via KEPSS with significance levels of 0.029 and 0.016 respectively which are both below 0.05. The study recommends that commercial banks should continue investing in ATMs as this was found to have positive influence on financial performance and also financial institutions should continue in convincing their customers to adopt utilization of KEPSS.

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ABBREVIATIONS

ACH	Automated Clearing House operations
ATM	Automated Teller Machine
CBK	Central Bank of Kenya
EFT	Electronic Funds Transfer
GDP	Gross Domestic Product
ICT	Information and Communications Technology
KEPSS	Kenya Electronic Payment and Settlement System
MFBs	Microfinance Banks
PAT	Profit after Tax
PBT	Profit before Tax
ROA	Return on Assets
ROE	Return on Equity
RTGS	Real Time Gross Settlement
SPSS	Statistical Package for Social Sciences

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Innovations in the financial sector is the arrival of a new or better product and/ or a process that lowers the cost of producing existing financial services, Nofie (2011). According to Merton (1995) financial innovations occur because market participants are constantly searching for new ways to make greater profits. Over the past decades the structure of the commercial banking sector has undergone dramatic change, despite the functions performed by the commercial banks remaining relatively constant. According to Tidd & Hull (2003) liberalized domestic regulation, intensified international competition, rapid innovations in new financial instruments, and the explosive growth in information technology fuel this change.

In the financial services industry, innovation is viewed as the act of creating and popularizing new financial instruments, technologies institutions and markets, which facilitate access to information, trading and means of payment Solans (2003). The primary revenue-enhancing innovations occurring today are in the platform for branch and phone center employees, and in the newest distribution channel, internet and mobile banking. While these innovations have aspects in common, they serve different needs in the distribution strategy of commercial banks (Mansury & Love, 2008).

1.1.1 Financial Innovation

Financial innovation is the unanticipated improvement in the array of financial products and instruments that are stimulated by unexpected change in customer needs and preferences, tax policy, technology and regulatory impulses Bhattacharyya & Nanda (2000). According to Akhtar

(1984) financial innovations lower the transaction cost of transferring funds from lower yielding money balances to higher yielding alternatives. Therefore, with financial innovations market participants attempt to minimize risk and to maximize return. These developments in the finance sector has led to increase in the number of financial institutions and also the development in the level of sophistication with new payment systems and asset alternatives to holding money.

According to Lawrence and Scott (2001) there are three types of financial innovations: institutional innovation, process innovations and product innovations. Institutional innovations relates to changes in banking structures, establishment of new types of financial intermediaries, and changes in the legal and supervisory framework. Process innovations covers the introduction of new business processes leading to increased efficiency, market expansion and client data management. These may include electronic banking, automated teller machines (ATMs), and Real Time Gross Settlement (RTGS). Product innovations include the introduction of goods or service with improved characteristics to respond to changes in market demand or to improve the efficiency. These may include new credit cards, personal unsecured loans, money transfer services, and mobile banking.

1.1.2 Financial Performance

Financial performance refers to how well a firm can use assets from its primary mode of business and generate revenues. Generally financial performance may be used to refer to firm' s overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. There are many different ways to measure financial performance, but all measures should be taken into aggregation. Items such as operating income, revenue from operations and cash flow from operations can be used, as well as total sales units Business Dictionary (2011)

According to Ahmad et al. (2011) financial performance of banks and other financial institutions has been measured using a combination of financial ratios analysis, benchmarking against budget or a mix of these methodologies. Financial performance of banks is usually expressed as a function of internal and external determinants. Internal determinants originate from bank accounts (balance sheet and/or profit and loss account) and therefore could be termed micro-bank specific determinants of performance. The external determinants are variables that are not related to bank management but reflect the economic and legal environment that affects the operation and performance of financial institutions.

Tavitiyan, Zhang and Qu (2012) indicate that return on assets (ROA), average annual occupancy rate, net profit after tax and return on investments (ROI) are the commonly used financial or accounting indicators by firms. According to Bagorogoza and Waal (2010) other measures of performance are profitability, productivity, growth, stakeholder satisfaction, market share and competitive position. For the purpose of this study profit before tax (PBT) will be used as a measure of banks' performance.

1.1.3 Financial Innovation and Financial Performance

Loof (2000) examines the existence of positive relationship between the innovation output measured by sales of new products per employee and five different measures of firm performance, namely: employment growth, value added per employee, sales per employee, operating profit per employee and return on assets. A positive relationship was observed for all the five factors. However, not all studies have confirmed the existence of this relationship. Folkeringa, Jong, and Wubben (2003) found a positive relationship between the innovation output – measured by the share of sales from new products in total turnover- and the growth of turnover together with employment but no significant relationship with profit.

Lyons, Chatman and Joyce (2007) argue that the relevant aspects of technological change include innovations that reduce costs related to the collection, storage, processing and transmission of information, as well as innovations that transform the means by which customers access the bank services. They cited automated teller machines (ATMs), telephone banking, internet banking and e-money as being among the significant innovations affecting the banking distribution system that influence the banks performance significantly.

According to Mansury and Love (2008) client relation management systems, banks management technologies and various other technologies are among major changes in the internal banking system that also have exercised a positive influence on banking performance and profitability

Mabrouk and Mamoghli (2010) argue that despite the undeniable importance of financial innovation in explaining banking performance, the impact of innovation on performance is still misunderstood for two main reasons; there is inadequate understanding about the drivers of innovation, and innovations' impact on banks performance remains lowly untested. Banks have continually invested heavily in technology to be able to increase their competitiveness, hence the study is meant to establish the relationship of the continued financial innovations to the financial performance of commercial banks in Kenya.

1.1.4 Commercial Banks in Kenya.

The Kenyan banking sector is comprised of 43 commercial banks, 1 mortgage finance company, 9 microfinance banks, 5 money remittance providers, 97 foreign exchange bureaus and 2 credit reference bureaus as at the period ended June 30th 2014 (CBK, 2014). The banking sector registered Ksh 71.0 billion pre-tax profits during the period ending June 30, 2014, which was an increase of 15.4 percent from Ksh61.5 billion for the period ending June 2013. Total income for

the period stood at Ksh 199.0 billion, a growth of 12.2 percent compared with Ksh 177.3 billion generated at the end of June 2013. However, total expenses increased by 10.4 percent from Ksh 115.9 billion in June 2013 to Ksh 128.0 billion in June 2014 (CBK, 2014)

According to CBK (2014) Kenya Electronic Payments and Settlements System (KEPSS) moved a volume of 2,230,049 transactions worth Ksh 24,311 billion in the year ended June 2014 compared to 1,757,482 transactions worth Ksh 20, 686 billion in the same period in the year ended June 2013. This represents a 26.9 percent increase in value and a 17.5 percent increase in volume. This shows an increased awareness of the public of KEPSS as a payment system CBK (2014).

In the Kenyan perspective financial innovation has happened in various forms, these include: mobile banking, stock brokerage and insurance services; with commercial banks moving to acquire stock brokerage firms, Islamic banking guided by the Islamic (Sharia) law (for example Gulf African Bank, First Community Bank, and Barclays Bank of Kenya), and electronic banking CBK (2014).

The financial sector in Kenya can be reviewed in three phases (Misati, Njoroge and Ouma, 2010). The first phase is in the 1970' s to early 1980' s. During this time, the financial sector was highly dominated by the banking sector, which was characterized by financial repression. The government played key role in allocating credit to investments by utilizing direct instruments of monetary policy such as interest rate controls, exchange rate controls and allocation of credit to priority sectors among other government restrictions (Misati et al. 2010).

The second phase began with advent of structural adjustment programmes and liberalization of policies in the late 1980' s. Over this period, relaxation of the interest rate, exchange rates and

capital accounts controls were witnessed. The essence of the financial sector reforms this time was to trigger narrow interest rates spreads, increase availability of financial resources through increased savings, enhanced efficiency in credit allocation and increased investments. Liberalization was also meant to encourage usage of indirect tools in monetary policy formulation (Misati et al. 2010).

The third phase is the late 1990' s to date which can be classified as the era of financial innovation and emerging financial instruments. The period has witnessed emergence of new products such as Islamic banking, automated teller machines (ATMs), plastic money and electronic-money (e-money) amongst others within the banking sector (Misati et al. 2010).

1.2 Research Problem

The relationship between the growing investment in technology based bank innovations and banks financial performance in Kenya needs to be studied to establish whether innovations have contributed to the financial performance of commercial banks in Kenya. This study will test the effect of financial innovation on the financial performance of commercial banks in Kenya. The study will analyze the relationship between commercial banks profitability in Kenya and two financial innovations, namely: number of ATMs and the number of transactions made using the Kenya Electronic Payments and Settlements System (KEPSS).

In the previous decade Kenya has experienced continued growth in the adoption of non-cash modes of payments. This includes an increase in number of ATMs in the payment card industry. There is also an increase in the mobile money transfer usage. Additionally Electronic Funds Transfer (EFT) transactions based payments have continuously increased. This growth may be attributed to commercial banks' business expansion strategies (CBK, 2014).

Studies on the banking sectors of 11 Latin American countries, Yildirim and Philippatos (2007) stipulate that rivalry between banks pushes the banks to engage differentiation process of the products they supply, and can contribute to financial innovation. According to Hendrickson and Nichols (2011), while studying the performance of small banks in the United States with regards to interstate branching, found out that banks perform better when they adopt innovations across their several branches. According to Franscesa and Claeys (2010) in their studies concluded that financial innovations had least impact on bank performance. These mixed conclusions have created the need to carry out the studies from a Kenyan perspective to establish the effect of financial innovations on financial performance of commercial banks.

Nyathira (2012) on the effect financial innovations on commercial banks in Kenya tested the correlation between two payment systems; Automated Clearing House (ACH) and Real Time Gross Settlement (RTGS), and banking sectors profitability. The study established a positive correlation between the two payment systems and profit after tax (PAT). According to annual CBK report (2014) there are various development and banking innovations that have taken place, they include: use of agency banking, growth of Microfinance Banks (MFBs), Kenya Electronic Payment and Settlement System (KEPSS), Automated Clearing House operations (ACH), automated teller machines (ATMs) and plastic card usage, and mobile phone usage for funds transfer. This study seeks to answer the question: what is the effect of financial innovations on the financial performance of commercial banks in Kenya?

1.3 Research Objectives

The objective of this study was to establish the effect of financial innovation on the financial performance of commercial banks in Kenya.

1.4 Value of the Study

The study findings can help banks in evaluating the importance of financial innovation on their performance in terms of their profitability. This will provide the management of commercial banks and firms in the financial services with more insight on the importance financial innovations to banks performance.

Through the study the government of Kenya is able to appreciate which areas of innovation to support in the banking sector, by either waiving taxes or through other incentives. The study is important to the Kenyan government, as it seeks to leverage on technology to grow the financial services sector and enhance access financial services.

The research will provide the much needed data to policy makers to drive economic development as Kenya strives to towards attaining vision 2030. The study can therefore guide policy makers towards crafting policies that promote financial innovation in an effective regulatory environment.

To the scholars, study will provide more literally material which will be of value to both students and researchers. The study will also help to identify areas for further research in financial innovation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature covers the key theories underpinning the study and the empirical studies carried out in the area of financial innovations in the banking sector. The chapter will expound in the research gaps that exists on financial innovations and financial performance.

2.2 Theoretical Review

There are various theories by different scholars that explain financial innovation. Theories reviewed and which inform the study are; Schumpeter theory of innovation, transaction cost innovation theory, task technology fit theory, circumvention innovation theory, and financial intermediation theory

2.2.1 Schumpeter Theory of Innovation

In the 1930s Schumpeter started studying how the capitalist system was affected by market innovations. After analyzing the capitalist model Schumpeter tried to understand what companies would be in a better position to innovate. He developed a theory where a company's ability to innovate was mainly connected to its size. Initially he defended that small companies should be in a better position to innovate due to flexibility while larger companies might get trapped in bureaucratic structures. Schumpeter (1928) argued that entrepreneurs, who could be independent inventors or research and development (R&D) engineers in large corporations, created the opportunity for new profits with their innovations. In turn, group of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation. However, before economy could equilibrate a new innovation or set of innovations,

conceptualized by Schumpeter as Kondratiev cycles, would emerge to begin the business cycle all over again.

Schumpeter (1939) drew a clear distinction between the entrepreneurs whose innovations create the conditions for profitable new enterprises and the bankers who create credit to finance the construction of the new ventures. Schumpeter (1939) emphasized that the special role of credit-creation by bankers was ‘ the monetary complement of innovations’ . Therefore, as independent agents who have no proprietary interest in the new enterprises they fund, bankers bear all the risk. This requires having the special ability to judge the potential for success in funding entrepreneurial activities. According to Schumpeter (1939) it is just as important to deny credit to those that lack that potential as it is to supply those that have the potential for success.

2.2.2 Transaction Cost Innovation Theory

According to Hicks and Niehans (1983) the main factor of financial innovation is the reduction of transaction cost, hence the transaction cost innovation theory. The theory discussed the motive and the process of financial innovation from different sides. It explains that the radical motive of financial innovation is to earn benefits from using such innovations. The reduction of transaction cost can stimulate financial innovation and improvement of financial services. Transaction costs theory is based non-convexities in transaction technologies, where the financial institutions act as coalitions of individual lenders and borrowers who exploit economies of scale or scope in the transaction technology. Transaction costs encompass not only exchange or monetary transaction costs, but also monitoring and auditing costs.

2.2.3 Task Technology Fit Theory

The task technology fit (TTF) theory contends that it is more likely to have a positive impact on individual performance and be used if the capabilities of information communication and technology (ICT) match the tasks that the user must perform (Goodhue and Thompson, 1995). They further discussed the factors that measure the task-technology fit as; quality, locatability, compatibility, eases of use/training, production timeliness, systems reliability, and relationship with users. This model is useful in the analysis of various context of a diverse range of information systems including electronic commerce systems and combined with or used as an extension of other models related to information systems outcomes.

2.2.4 Circumvention Innovation Theory

Circumvention theory was pioneered by Kane (1981). According to Kane (1981) many forms of government regulations and controls, which have the same property of implicit taxation, embarrass the profitable activity engaged by the company and the opportunity of earning profit, hence the market innovation and regulation innovation should be regarded as the continuous fighting process between independent economic force and political force. According to the theory financial innovation is induced mostly by the purpose of earning profit and circumventing government regulations. The regulation innovation assumed by Kane's is in the direction of reinforcing regulation, whereas, the regulation innovation in reality is towards the direction of liberal markets innovation. The theory did not only consider the origin of innovation in the market but it also explained the process of regulation innovation and their dynamic relation.

2.2.5 Financial Intermediation Theory

According to the financial intermediation theory financial innovations occur because agents in the market are searching for new ways to make higher profits. A change in the economic

environment triggers a search for financial innovations that are likely to be profitable. Informational asymmetries generate market imperfections hence deviations from the neoclassical framework, these imperfections lead to different forms of transaction costs. Financial intermediaries are seen to overcome these costs partially. Diamond and Donner (2007) consider banks as coalitions of depositors that provide households with insurance against idiosyncratic shocks that adversely affect their liquidity position. According to Diamond (1984), he views financial intermediaries as delegated monitors on behalf of the ultimate savers.

2.3 Determinants of Financial Performance of Commercial Banks

Mohana et al. (2012) major internal factors affecting the performance of banks include: capital structure, asset quality, management efficiency, earning quality, liquidity, bank size technology, human capital, loan performance, and income diversification among other factors. Moreover, those factors that are beyond the managements control are referred as external or macroeconomic factors and these factors are related to the industry. They include: bank concentration, inflation, real GDP growth, effective tax rate, and interest rate. Mohana et al. (2012). This study will focus on innovation besides other internal determinants of commercial banks profitability.

2.3.1 Cost Efficiency

According to Dawood (2014) a negative relationship exists between cost efficiency and profitability. When the profitability increases cost efficiency decreases. Athanasoglou et al. (2005) suggest that enhanced managerial and scale efficiency leads to higher profitability.

2.3.2 Liquidity

Dawood (2014) concluded that there is a negative relationship between liquidity and profitability. This is consistent with Gul et al. (2011). High liquidity means that banks have less deposits and short term borrowed fund.

2.3.3 Capital Adequacy and Deposits

Dawood (2014) concluded that they both formulate a positive relationship with profitability of commercial banks. However, Capital adequacy develop a significant relationship while deposits develop an insignificant relationship, hence deposits do not lead to any type of profitability for commercial banks this result is consistent with Fredric (2014). This indicates that with more equity the chances of return on assets will be lower.

2.3.4 Size

Dawood (2014) established an insignificant positive relationship between size of a bank and profitability. This result is similar to Fredric (2014) but not consistent with Gul et al. (2011) which found a significant positive relationship of size with ROA.

2.3.5 Management Efficiency

According to Olweny and Shiphoh (2011) balanced portfolio theory added additional dimension into the study of bank performance. The theory suggests that the portfolio composition of the bank, its profit and the return to the shareholders is the result of the decisions made by the management and the overall policy decisions. Hence banks performance is affected by both internal and external environment.

2.3.5 Asset Quality

The banks' asset is another bank specific variable that affects the profitability of a bank. The bank asset includes among other current assets, credit portfolio, fixed asset and other investments. Often a growing asset (size) related to the age of the bank Athanasoglou et al., (2005). More often than not the loan of a bank is the major asset that generates the major share of the banks' income. Loan is the major asset of commercial banks from which they generate income. The quality of loan portfolio determines the profitability of banks.

2.3.6 Financial Innovation

Various scholars have contended that there is a significant relationship between financial innovation and financial performance of commercial banks while other scholars have claimed scholars that the relationship is insignificant. Both Agboola (2006) and Thokor (2007) have pointed out that there is a positive relationship between financial innovation and financial performance while Prager (2001) and McAndrews (2002) concluded that innovations have negative effects on performance. This study will establish the nature and significance of relationship between financial innovation and financial performance of commercial banks in Kenya.

2.4 Empirical Studies

According to Schumpeter (1934) innovations can lead to competitive advantage that can be exploited by innovative firms. Based on his work substantial body of research suggests that the relationship between a firm' s level of innovation and financial performance should be positive. Schumpeter (1934) emphasized the role of entrepreneurship and the seeking out of opportunities for novel value generating activities which would expand and transform the circular flow of income, however, he did so with reference to a distinction between invention or discovery on one

hand and innovation, commercialization and entrepreneurship on the other side. The separation of invention or discovery and innovation marked out the typical nineteenth century institutional model of innovation, where independent investors used inventions as potential inputs to entrepreneurial firms.

Sullivan (2000) compares banks in the 10th Federal Reserve District 19 that had transactional internet web-sites as of the first quarter of 2000 to those that did not have such web-sites. He found the former to be significantly larger and located in areas with a more educated population and higher population fraction in the 18 to 64 age group. Banks offering transactional web-sites are also found to have higher non-interest expenses and higher non-interest income.

According to Jayawardhena and Foley (2000) internet banking results in cost and efficiency gains for banks yet very few banks were using it and only a little more than half a million customers were online in the U.K. Klomp and Van Reeuwen (2001) found a positive relationship between innovation output and sales growth but does not show any form of relationship between the innovation output and the employment growth. Prager (2001) found that the level of ATM surcharge is negatively related to deposits market share of small banks. McAndrews (2002) studies on the effect of ATMs surcharges on banks profitability, concluded that ATMs surcharges increases market share and profitability of large banks but reduces the market share and profitability of smaller banks.

Simpson (2002) suggests that e-banking is driven largely by the prospects of operating cost minimization and operating revenues maximization. A comparison of online banking in developed and emerging markets revealed that in the developed markets, lower costs and higher revenues are more noticeable. Lang. and Nolle (2002) analyze data in the internet banking as of

the third quarter of 1999. Using logit models, they find 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, greater numbers of service offerings were positively related to bank size and the length of time offering internet banking.

A study in the Brazilian banks indicated that IT creates value flows that occur internally such as cost savings, product quality, and innovative service or product (Berger, 2003). While conducting research in electronic services, Tufano (2003) observed that web technology provides situation-specific or personalized communication. A case is, customers can complain about a certain product or service in order to get their specific needs and wants using various means; frequently asked questions (FAQs) page, live online help, and email, whereas the supplier responds more rapidly.

Shu and Strassmann (2005) conducted a survey on 12 banks in the United States for the period of 1989 to 1997. They found out that even though Information Communication Technology has been one of the most dynamic factors relating all efforts, it could not improve banks earnings. Kozak (2005) studied the influence of the evolution in Information Technology on the profit and cost effectiveness of the US banking sector during the period of 1992 to 2003. The study revealed an optimistic relationship among the executed Information Technology, productivity and cost savings. Hauner and Peiris (2005) cite ATMs, telephone banking, internet banking and e-money as being among the significant innovations affecting the banking distribution system that influence banking performance significantly. However, according to (Aghion et al, 2005) the extraordinary profits will dwindle as innovations are widely adopted.

Batiz-Lazo and Woldesenbet (2006) in their examination of the dynamic financial innovation in the banking sector in the U. K, stipulated that a distinction between product innovation and process innovation is necessary as much as the adoption of each type of innovation has its own characteristics and has different impact on banking performance. Informed by these previous studies this study will sought to establish the effects of financial innovations to financial performance of commercial banks in Kenya.

Agboola (2006) in his study on information and communication technology (ICT) in banking operations in Nigeria using the nature and degree of innovative technologies; degree of the utilization of identified technologies; and the impact of adoption of ICT devices on banks, found out that technology was the main driving force of competition in the banking industry. During his study he witnessed increase in the adoption of automatic teller machines (ATMs), electronic funds transfer (EFT), smart cards, electronic home and office banking, and telephone banking. Agboola (2006) indicates that adoption of ICT improves the banks' image and leads to a wider, faster and more efficient market. He asserts that it is imperative for bank management to intensify investment in ICT products to facilitate speed, convenience and accurate services, or otherwise lose out to their competitors.

Shirley and Sushanta (2006) studied the impact of Information Technology (IT) on the banking industry and analyzed both the theoretically and empirically how Information Technology; internet banking, electronic payments, security investments, and information exchanges related spending can affect bank profits via competition in financial services that are offered by the banks. Their studies covered 68 US banks for a period of over 20 years to estimate the impact of IT on profitability of banks. They found out that though IT might lead to cost saving, higher IT spending can create networks effect lowering banks profitability. They further agreed that the

relationship between IT expenditures and bank' s financial performance is conditional to the extent of network effect. They explained that if the network effect is too low, IT expenditures are likely to reduce payroll expenses, increase market share, and increase revenue and profit.

According to Noyer (2007), financial innovation has not only opened up new opportunities for the sector participants, but also increased new market players arising from new products in the financial market. These developments have increased the range of financing and investment opportunities available to economic agents besides changing the role of banks with expanded diversification choices in terms of portfolio and sources of financing. Krugman (2007) explored both the market and the process-level factors, to understand the barriers to electronic commerce investment. Based on the major US banks his studies indicated that regulation was a major barrier towards innovation of the banks. Boot and Thakor (2007) pointed out that adoption of client relation management systems, bank management technologies and various other technologies are among the major changes in the internal banking systems, and have shown positive banking performance and profitability.

Molhotra and Singh (2009) in their study on the impact of internet banking on bank performance and risk found out that on average internet banks are larger, they are more profitable and are more operationally efficient. Molhotra and Singh (2009) also found out that internet banks have higher asset quality and are better managed to lower the expenses for building and equipment and that internet banks in India rely substantially on deposits. They further observed that smaller banks in that adopt internet banking have been negatively impacted on profitability.

Nader (2011) in his study on the profit efficiency of Saudi Arabia commercial banks in the period 1998 to 2007, concluded that phone banking, number of ATMs and number of branches

had a positive effect on profit efficiency of Saudi Arabia banks. On the other side he found out that the number of point of sale terminals (POSs), availability of PC banking and availability of mobile banking did not improve the profit efficiency.

According to Chung and Dutta (2012) internet based banking has become quite common. They explain that banks have realized the potential of internet banking and have recognized that it is necessary to integrate the customers' new lifestyle and web based activity preferences with their business models. They also noted that internet banking has brought about unprecedented speed in banking system and hence playing a major role in the globalization of banking system. As internet banking inroads to banking business, the market participants have also started to use internet for security trading activities. Through the adoption of online trading, there has been an upward trend in trading frequency, trading volume and turnover ratio.

Daveshnar and Ramesh (2012) carried out a study on a panel of two public banks for the period 1998 to 2009 to examine the impact of IT investments on profitability and productivity of Indian public sector banks. Their study focused on two statistical tools in terms of correlation and regression analysis. The results indicated that investments on IT contributed to increased amount of deposits and return on assets (ROA) as profitability per employee as productivity indicator and reduces the net non-performing assets ratio and staff costs. The study further showed that public banks tried to adopt cost reduction and assets quality strategies to compete in the Indian bank market.

According to Mwangi (2007) in Kenya where less than a quarter of the population has bank accounts, banks have spurred into action in the consumer market by the success of the mobile money transfer services. Mobile money transfer was first launched in Kenya by Safaricom

mobile operator in 2007 through M-pesa and other mobile operators today provide similar services. This innovation has brought significant changes in the country's banking and financial services landscape. (Oloo, 2007) in a survey in the Kenyan banking sector revealed that the flurry of fresh entrants is credited with bringing down banking charges, improve access to banking services, and spark of a wave of new products and services in the banking sector.

According to King' ori (2008) one of the latest boost to financial services in Kenya is the partnership between mobile operators and commercial banks which, above doing away with account-opening fees and monthly charges, pays interest and offers account holders access to emergency credit facilities. King' ori (2008) observed that from his study on the determinants of income velocity of money in Kenyan financial sector, innovations and changes are taking over the financial sector by storm. This has increased competition in the Kenyan financial services sector. The greater circulation of money means more businesses are coming up, and leads to better investment prospects as investor fell more comfortable.

Githikwa (2009) carried out a study on the relationship between financial innovation and profitability of commercial banks in Kenya. The findings concluded that banks conceptualized financial innovation as a means to create impact in the profit performance. The studies revealed that through implementing product, process and institutional innovation, commercial banks become more flexible in their operations and it leads to acquisition of more qualified personnel in the bank, quality products and allows bank expansion. The study also revealed that implementation of financial innovation requires more banks to have a great deal of resources, however, it reduces costs of operations, reduce cost per transaction and equally enable banks to satisfy the customer needs.

Nyathira (2012) in a study on the effect financial innovations on commercial banks in Kenya tested the correlation between two payment systems; Automated Clearing House (ACH) and Real Time Gross Settlement (RTGS), and banking sectors profitability. Her study period was four years extending from 2008 to 2011. The study established a positive correlation between the two payment systems and profit after tax (PAT).

Waweru (2012) in her study on the effects of financial innovations on risk management of commercial banks in Kenya, concluded that financial innovations have exposed commercial banks in Kenya to various risks, these are; credit risk, liquidity risk, interest rate risk, country risk, compliance risk and reputational risks. The researcher recommended a more robust risk mitigation practices and policies to ensure that all elements of risk are captured in the risk index factors of commercial banks.

2.5 Summary of Literature Review

From the reviewed literature several writers like: Simpson (2002), Agboola (2006), Thokor (2007), Mwangi (2007), Malhotra and Singh (2009), Githikwa (2009), Nofie (2011), and Daveshnar and Ramesh (2012) it has come out that innovations have positive impact on performance indicators, pointing out on profitability and operational efficiency. However other scholars like: Prager (2001), McAndrews (2002), Folkerling, Jong, and Wubben (2003), Frascosa and Claeys (2010), and Nader (2011) found that innovations have negative effects on performance indicators. These mixed findings leave a gap for further research on the effects of innovations on key financial performance indicators.

The literature reviewed also shows a concentration of innovation-performance studies on profitability mostly in developed and emerging economies, leaving a gap of innovation

performance literature in Africa and specifically in Kenya. As shown in this chapter a lot of innovations have taken place in Kenya but little is known about the implications of financial innovations on the commercial banks financial performance. This study intends to fill these knowledge gaps in literature by studying the effects of bank innovations on the financial performance of commercial banks in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter looks at the methodology that was used to carry out the research. The chapter examines the research design, the population, the sample size and sampling technique, and the data collection method used to collect primary or secondary data required in the study. There will also be details on data analysis, showing the analytical models used and tests carried out.

3.2 Research Design

The research adopted a descriptive design that is aimed at establishing the effect of financial innovation on the financial performance of commercial banks in Kenya. According to Kothari (2004) a descriptive design is seeks to explain accurately the characteristics of a particular individual, situation or a group. Descriptive research includes surveys and fact finding enquiries and describes the state of affairs as it exists at present Kothari (2004). The descriptive design enabled the researcher to summarize the findings in a way that provided information on the effect of financial innovations on financial performance of commercial banks in Kenya.

3.3 Population and Sample

The population comprised of 43 commercial banks licensed by the Central bank of Kenya as at 30th June 2014. This is going to be a census study and therefore there was no sampling.

3.5 Data Collection

The study collected and analyzes consolidated data of 43 commercial banks in Kenya. Quantitative secondary data was obtained from reports published by the Central Bank of Kenya (CBK). The CBK is the regulator of banking sector in Kenya. For the dependent variable; profit

before tax secondary data was extracted from CBKs annual bank supervision reports. For the independent variables secondary data was extracted on the number of ATMs, and the number of transactions made using Kenya Electronic Payment and Settlement System (KEPSS) from CBK annual reports. The CBK is the best source of this secondary data as it is the official regulator of commercial banks in Kenya. A study period of 4 years (2011-2014) was used.

3.6 Data Analysis

Multiple regression analysis method was used to study the nature and the strength of relationship between the dependent and the independent variables. Multiple regression analysis is applied where there is more than one independent variable. In this study the dependent variable used was the profit before tax, while the independent variables were the number of ATMs and the number of transactions made using the KEPSS. For the purpose of the study liquidity, management efficiency and asset quality was used as the control variables. Variables data was analyzed using Statistical Package for Social Sciences (SPSS).

The regression analysis model was of the form shown below:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 L_t + \beta_4 ME_t + \beta_5 AQ_t + e$$

Where:

Y – Dependent variable: Commercial banks' consolidated Profit before tax.

X₁ – Independent variable₁: number of ATMs for year_{1...n}

X₂ – Independent variable₂: number of transactions made using the KEPSS year_{1...n}

a – Constant.

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ - Coefficients of the independent variables and control variables.

e is the error term which is assumed to be normally distributed with mean zero and constant variance.

Y changes when X_j changes by one unit holding everything else constant.

The equation is solved to get the values of $a, \beta_1, \beta_2, \beta_3, \beta_4,$ and β_5

Coefficient of determination denoted by R^2 was calculated to determine the extent to which the dependent variable (Y) is explained by the independent variables (X_2 and X_1). The higher the value of R^2 the stronger the relationship being examined

Coefficient of correlation (r) was examined to test the nature and the strength of the relationship existing between independent variables and the dependent variable. The coefficient of correlation lies between -1 and +1 ($-1 < r < +$). Where value of r is +1 it means there is a perfect positive correlation between the variables. When the value of r is 0 it means that the variables are uncorrelated. Where the value r is -1 it means that there is a perfect negative correlation between the variables. Therefore, the closer r is to -1 or +1 the stronger the relationship between the variables and the closer r is to 0, the less close the relationship. The correlation coefficient was calculated by finding the square root of the coefficient of determination (R^2) hence;

Due to inherent sampling errors it is possible to get a non-zero value for (r) where it was supposed to be zero. This creates the risk of concluding existence of a relationship where none actually exists. To remedy this it is therefore necessary to take a t test t test was used to test the significance of the independent variables as the predictors of the dependent variable. A hypothesis test is undertaken as follows:

Ho: X is not a significant determinant of Y

H₁: X is a significant determinant of Y

The Standard error (S_e) will be computed to examine the magnitude of the error contained in the forecast using the whole equation. The lower the value of the error the better the equation.

The Standard error of the slope (S_b) will be computed to examine the magnitude of the error that is contained in the value of the slope. The lower the error the better the equation.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents analysis and findings of the research. The objective of this study was to establish the effect of financial innovation on the financial performance of commercial banks in Kenya for the period between 2011 -2014.

4.2 Descriptive Statistics

4.2.1 Number of ATMs for year

Table 4.1: Number of ATMs for year

Year	Mean	Std deviation
2011	2176.58	0.12
2012	2293.92	0.17
2013	2443.45	0.13
2014	2586.67	0.14

The research sought to assess the trend in number of number of ATMs in each year, from the research findings the year 2014 recorded the highest number of operational number of ATMs as shown by a value of 2586.67, while the years 2011 recorded the lowest number of operational number of ATMs as shown by a value of 2176.58.

Further values for standard deviation depict variability in number of ATMs during the four – year period with the highest deviation of 0.17 in the year 2012 and the lowest at 0.12 in the year 2010. The findings shows notable increase in number of ATMs in each year from 2011 to 2014

4.2.2 Number of transactions made using the KEPSS

Table 4.2: Number of Transactions Made Using the KEPSS

Year	Mean	Std deviation
2011	103461.1	0.011
2012	130677.1	0.011
2013	164823.9	0.009
2014	132692.1	0.015

The research sought to assess the trend on number of transactions made using the KEPSS, from the research findings the year 2013 recorded the highest number of transactions made using the KEPSS as shown by a value of 164823.9, while the years 2011 recorded the lowest number of transactions made using the KEPSS as shown by a value of 103461.1.

Further the values for standard deviation depict variability in number of transactions made using the KEPSS during the four – year period with the highest deviation of 0.015 in the year 2014 and the lowest at 0.009 in the year 2013. The findings shows notable increase in in number of transactions made using the KEPSS from 2011 to 2013 and a significant decrease in the years 2014

4.2.3 Management Efficiency

Table 4.3: Descriptive Statistics on Management Efficiency

Year	Mean	Std deviation
2011	65.10	0.24
2012	69.70	017
2013	65.30	0.29
2014	66.30	0.10

The research sought to assess the trend in management efficiency, from the research findings it noted that in the year 2014 recorded the highest value in management efficiency, as shown by a

66.30 percent while the years 2011 recorded the lowest value in management efficiency as shown by a value of 65.10 percent

Further the values for standard deviation depict variability in management efficiency during the four – year period with the highest deviation of 0.29 in the year 2013 and the lowest at 0.10 in the year 2014. the findings shows an increase in management efficiency from 2011 to 2014.

4.2.4 Asset Quality

Table 4.4: Descriptive Statistics on Asset Quality

Years	Total Loans and Advances	Gross performing loans	Non Net Asset Qualities
2011	1,190,985	52,958	1,138,027
2012	1,330,365	61,917	1,268,448
2013	1,578,768	81,857	1,496,911
2014	1,940,781	108,300	1,832,481

From the results, the lowest net value for asset qualities was 1,138,027 in 2011 while the highest was 1,832,481 in 2014. the findings revealed that there have been a significant increase in asset quality during the four-year period.

4.2.5 Liquidity

Table 4.5: Descriptive Statistics on Liquidity levels

Year	Mean	Std deviation
2011	37.00	0.24
2012	41.90	0.16
2013	38.60	0.28
2014	37.70	0.13

The research sought to assess the levels in liquidity, from the research findings the year 2012 recorded the highest value in liquidity, as shown by a 41.90 percent while the years 2011

recorded the lowest value in liquidity as shown by a value of 37 percent. Further the values for standard deviation depict variability in liquidity during the four year period with the highest deviation of 0.28 in the year 2013 and the lowest at 0.13 in the year 2014.

4.3.6 Commercial Banks Consolidated Profit Before Tax

Table 4.6: Descriptive Statistics on Banking Sector Profits' Before Tax

Year	Ksh (Millions)	
	Mean	Std deviation
2011	88,478	.113
2012	106,996	.248
2013	124,547	.174
2014	139,861	.047

The research sought to establish the banking sector profits before tax, from the research findings the year 2014 recorded the highest value in profits before tax, as shown by 139,861 while the years 2011 recorded the lowest value in profits before tax as shown by a value of 88,478.

In addition the values for standard deviation depict variability in value in profits before tax during the four year period with the highest deviation of 0.248 in the year 2012 and the lowest at 0.047 in the year 2014. The findings shows an increase in the value of profits before tax from 2011 to 2014.

4.3 Correlation

Table 4.7: Correlations

		Financial performance of commercial banks	Number of ATMs	Number of transaction via KEPSS	Management efficiency	Asset quality	Liquidity levels
Financial performance of commercial banks	Correlation Coefficient	1.000	.531	.501	.513	.561	-.257
	Sig. (2-tailed)	.	.016	.029	.024	.002	.014
	N	43	43	43	43	43	43
ATMs technology	Correlation Coefficient	.531	1.000	.142	.037	.001	.012
	Sig. (2-tailed)	.016	.	.000	.003	.002	.004
	N	43	43	43	43	43	43
Number of transaction via KEPSS	Correlation Coefficient	.501	.142	1.000	.046	.008	.146
	Sig. (2-tailed)	.029	.002	.	.000	.000	
	N	43	43	43	43	43	43
Management efficiency	Correlation Coefficient	.513	.037	.046	1.000	.124	.218
	Sig. (2-tailed)	.024	.000	.001	.	.002	.015
	N	43	43	43	43	43	43
Asset quality	Correlation Coefficient	.561	.001	.018	.124	1.000	.131
	Sig. (2-tailed)	.002	.001	.003	.000	.	.017
	N	43	43	43	43	43	43
Liquidity levels	Correlation Coefficient	-.257	.011	.023	.024	.151	1.000
	Sig. (2-tailed)	.014	.018	.022	.016	.001	
	N	43	43	43	43	43	43

On the correlation of the study variable, the researcher conducted a Pearson moment correlation. From the findings in the table above, the study found that there was strong positive correlation coefficient between financial performance of commercial banks in Kenya and adoption of ATMS technology, as shown by correlation factor of 0.531, this strong relationship was found to be statistically significant as the significant value was 0.016 which is less than 0.05, the study found strong positive correlation between financial performance of commercial banks in Kenya and transaction made via KEPSS as shown by correlation coefficient of 0.501, the significant value was 0.029 which is less than 0.05.

The study found strong positive correlation between financial performance of commercial banks in Kenya and management efficiency as shown by correlation coefficient of 0.513, this too was also found to be significant at 0.024, the study found strong positive correlation between financial performance of commercial banks in Kenya and asset quality as shown by correlation coefficient of 0.561 at 0.002 levels of confidence and finally the study found negative correlation between financial performance of commercial banks in Kenya and high liquidity levels as shown by correlation coefficient of (- 0.257 at 0.014 levels of confidence. The findings concur with Agboola (2006) who found out that strong positive correlation between management efficiency and performance of financial institutions.

4.4 Regression Analysis

In this study, a multiple regression analysis was conducted to test the influence among predictor variables. The research used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the multiple regressions. The model summary are presented in the table below

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.818 ^a	.669	.652	.33120

The study used coefficient of determination to evaluate the model fit. The adjusted R^2 , also called the coefficient of multiple determinations, is the percent of the variance in the dependent variable explained uniquely or jointly by the independent variables. The model had an average adjusted coefficient of determination (R^2) of 0.652 and which implied that 65.2% of the variations in financial performance of commercial banks in Kenya are explained by the independent variables

understudy (number of ATMs, number transactions made using the KEPSS, management efficiency, asset quality and liquidity level).

The study further tested the significance of the model by use of ANOVA technique. The findings are tabulated in table below.

Table 4.9: Summary of One-Way ANOVA results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	70.9	5	14.18	7.3701	.000 ^b
	Residual	71.188	37	1.924		
	Total	142.088	42			

Critical value = 2.44

From the ANOVA statics, the study established the regression model had a significance level of .000 which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%. The calculated value was greater than the critical value ($12.905 > 2.44$) an indication number of ATMs, transactions made using the KEPSS, management efficiency, asset quality and liquidity all have a significant effects on financial performance of commercial banks in Kenya. The significance value was less than 0.05 indicating that the model was significant.

In addition, the study used the coefficient table to determine the study model. The findings are presented in the table below.

Table 4.10: Coefficients

Model	Unstandardized		Standardized	t	Sig.
	Coefficients				
	B	Std. Error	Beta		
1 (Constant)	.689	.142		4.852	.031

Number of ATMs	.329	.071	.311	4.634	.002
Transactions made using the KEPSS	.358	.087	.345	4.115	.011
Management efficiency	.464	.101	.451	4.594	.020
Asset quality	.569	.123	.532	4.626	.017
Liquidity	-.216	.051	-.220	- 4.235	.023

As per the SPSS generated output as presented in table above, the equation

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon$) becomes:

$$Y = 0.689 + 0.329X_1 + 0.358X_2 + 0.464X_3 + 0.569X_4 + (-0.216X_5)$$

From the regression model obtained above, a unit change in number of ATMs for year would lead to an increase in financial performance of commercial banks in Kenya by a factor of by a factor of 0.329, a unit change number of transactions made using the KEPSS would lead to an increase in financial performance of commercial banks in Kenya by a factor of 0.358, a unit increase in management efficiency, while holding other factors at constant would cause an increase in financial performance of commercial banks in Kenya by a factor of 0.464, a unit increase in asset quality, while holding other factors at constant would cause an increase in financial performance of commercial banks in Kenya by a factor of 0.569 and that a unit increase in liquidity, while holding other factors at constant would cause an decrease in financial performance of commercial banks in Kenya by a factor of - 0.216.

The analysis was undertaken at 5% significance level. The criteria for comparing whether the predictor variables were significant in the model was through comparing the obtained probability value and $\alpha=0.05$. If the probability value was less than α , then the predictor variable was significant otherwise it wasn't. All the predictor variables were significant in the model as their probability values were less than $\alpha=0.05$.

4.5 Interpretation of Findings and Discussion.

From the descriptive statistics, the research established that there was an increase in number of ATMs from the years 2011 to 2014, the study also found strong positive correlation between number of ATMs and financial performance of commercial banks (Correlation Coefficient value 0.531, P-value 0.016) the research also established that ATM technology was driven largely by the prospects of operating costs minimization and operating revenues maximization, adoption of IT in financial sector had led to changes in industry structure and competition and many of the financial institutions were using IT to do businesses. The study also noted that ATMs are a cost-efficient way of yielding higher productivity as they achieve higher productivity per period of time than human teller; ATMs have eliminated the need to enter a bank for basic transactions and allow access to accounts at machines the findings support the literature provided by Mwangi (2013) on Innovations and financial performance which illustrated that, bank innovations had statistically significant influence on income, return on assets, profitability and customer deposits of commercial banks.

The study further revealed that introduction of IT in banking sector has revolutionized and redefined the ways banks operate. In general, the financial innovations in the Kenya's banking sector influence financial performance of commercial banks positively. This has a significant effect on the profitability of the commercial banks which also contributes to commercial banks competitive advantage.

The research investigated on the trend of transactions made using the KEPSS and financial performance, the study established that there has been an increase in number of transactions made using the KEPSS from the years 2011 to 2014, the study also found strong positive correlation between number of transactions made using the KEPSS and financial performance of

commercial banks (Correlation Coefficient value 0.501, P- value 0.029). The regression coefficient indicated that, an increase in the number of transactions made using the KEPSS would lead to significant growth in the financial performance of banks. Therefore, increasing transactions made via the KEPSS brings in improved performances in finance.

The research also noted that there was high number of withdrawals via KEPSS which were charged at fair rates compared to withdrawals over the counter and thus luring more customers to opt for KEPSS usage, the research also noted that adoption of the KEPSS had led to automation of services thereby leading to downsizing in the organisation and thus positive performance. The findings support Kamau (2002) suggestion that KEPSS is driven largely by the prospects of operating costs minimization and operating revenues maximization.

The study investigated the effect of management efficiency on financial performance of commercial banks, from the research findings, the study found a strong positive correlation between management efficiency and commercial banks consolidated profit before tax (Correlation Coefficient value 0.513, P- value 0.024) the research also established a negative relationship between poor asset quality and financial performance. This means banks which fail to monitor their credit loans tend to be less profitable than those which pay close attention to assets quality.

The research investigated the relationship between asset quality and financial performance of commercial banks; the findings as well indicated that quality of the assets and the financial performance of banks are strongly and positively correlated. This had a correlation coefficient of 0.561 indicating that the two variables are strongly associated. The regression coefficient indicated that, an increase in the quality of the assets would lead to significant growth in the

financial performance of banks. Therefore, increasing quality of assets brings in improved financial performance. The research also established that banking sector has to take great care of the variables which relate to asset liability management and that all the banking groups have to take necessary steps to improve the overall performance of the banking sector.

The study further established that loan is the major asset of most financial institutions from which they generate income, the quality of loan portfolio determines the financial performance of commercial banks. The loan portfolio quality has a significant impact on the financial performance of commercial banks, order to be effective in banks, the management of assets and liabilities must take into consideration the risk level, earnings, liquidity, profit, solvency, the level of loans and deposits, the value of assets and liabilities of the bank had a direct effect on the profitability of the bank, decrease in assets value leads to increase in banking profitability.

The study also found negative correlation between high levels of liquidity and financial performance of commercial banks (Correlation Coefficient value - 0.257, P- value 0.014) The research also established that bank' s liquidity needs and the sources of liquidity available to meet those needs depend significantly on the bank' s business and product mix, balance sheet structure and cash flow profiles of its on- and off-balance sheet obligations. The study also revealed that banks should ensure that assets are prudently valued according to relevant financial reporting and supervisory standards. Banks should fully factor into its risk management the consideration that valuations may deteriorate under market stress, and take this into account in assessing the feasibility and impact of asset sales during stress on its liquidity position.

Further the study found that profitability of the commercial banks in Kenya is negatively affected by increase in the liquidity gap and leverage. With a significant liquidity gap, the banks may

have to borrow from the repo market even at a higher rate thereby pushing up the cost of banks. The level of customer deposit was also found to positively affect the bank' s profitability and it will therefore be encouraged for banks to open more branches in the country. Kimari (2013) concluded that there was a positive relationship between credit risk management and financial performance of banks in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the study findings, conclusion and recommendations. The objective of this study was to establish the effect of financial innovation on the financial performance of commercial banks in Kenya.

5.2 Summary

The objective of this study was to establish the effect of financial innovation on the financial performance of commercial banks in Kenya.

The study found a strong positive correlation between number of ATMs and financial performance of commercial banks, the research also established that ATM technology was driven largely by the prospects of operating costs minimization and operating revenues maximization, IT has led to changes in industry structure and competition and many firms have used IT to support the creation of new businesses, the study also noted that ATMs are a cost-efficient way of yielding higher productivity as they achieve higher productivity per period of time than human teller; ATMs have eliminated the need to enter a bank for basic transactions and allow access to accounts at machines the findings supports the literature provided by Mwangi (2013) on Innovations and financial performance which illustrated that, bank innovations had statistically significant influence on income, return on assets, and profitability and customer deposits of commercial banks. The study further revealed that introduction of IT in banking sector has revolutionized and redefined the way banks operates, In general, the financial innovations in the Kenya' s banking sector influence financial performance of commercial banks

positively. This has a significant effect on the profitability of the commercial banks which also influence their competitive advantage.

The research investigated the Relationship between Numbers of transactions made using the KEPSS and financial performance, from the research findings the study revealed an increase in number of transactions made using the KEPSS from 2011 to 2013, the study also found strong positive correlation between number of transactions made using the KEPSS and financial performance of commercial banks. The regression coefficient indicated that, an increase in the number of transactions made using the KEPSS would lead to significant growth in the financial performance of banks. Therefore, increasing transactions made via the KEPSS brings in improved financial performances in commercial banks. The research also noted that there were high number of withdrawals via KEPSS which were charged at fair rates compared to withdrawals over the counter and thus luring more customers to opt for KEPSS usage, it was also noted that adoption of the KEPSS had also led to automation of services thus leading to downsizing in the organisation and thus positive performance. The findings support Kamau (2002) suggestion that KEPSS is driven largely by the prospects of operating costs minimization and operating revenues maximization.

The study found strong positive correlation between management efficiency and commercial banks' consolidated profit before tax (Correlation Coefficient value 0.513, P- value 0.024) the research also established a negative relationship between poor asset quality and financial performance. this means banks which fail to monitor their credit loans tend to be less profitable than those which pay particular attention to assets quality the findings confirm the findings by poor expenses management is the main contributors to poor profitability Sufian And Chong (2009) the research also established that management efficiency is one of the key internal factors

that determine the financial performance of the firm, management efficiency is represented by different financial ratios like total asset growth, loan growth rate and earnings growth rate, management efficiency is one of the complexes subject to capture with financial ratios, and that the capability of the management to deploy its resources efficiently, income maximization, reducing operating costs can be measured by financial ratios.

The findings on the relationship between asset quality and financial performance of commercial banks as well indicated that quality of the assets and the financial performance of banks are strongly and positively correlated. This had a correlation coefficient of 0.561 indicating that the two variables are strongly associated. The regression coefficient indicated that, an increase in the quality of the assets would lead to significant growth in the financial performance of banks. Therefore, increasing quality of assets brings in improved performances in finance. The research also established that banking sector has to take greatest care on the variables which relate to asset liability management and that all the banking groups have to take necessary steps to improve the overall performance of the banking sector.

The study also found negative correlation between high levels of liquidity and financial performance of commercial banks (Correlation Coefficient value - 0.257, P- value 0.014) The research also established that bank' s liquidity needs and the sources of liquidity available to meet those needs depend significantly on the bank' s business and product mix, balance sheet structure and cash flow profiles of its on- and off-balance sheet obligations.

5.3 Conclusion

The study also found strong positive correlation coefficient between financial performance of commercial banks in Kenya and adoption of ATM technology, the study also revealed that ATM

innovations offer financial institutions the opportunity to transform the ATM from a cash dispenser to a customer relationship management tool, helping to enhance loyalty among all customers, particularly those who almost exclusively use the ATM. The study concludes that adoption of ATM technology had a positive influence on the financial performance of commercial banks in Kenya.

From the research findings the study revealed a increase in in number of transactions made using the KEPSS from 2011 to 2013, the study also found strong positive correlation between number of transactions made using the KEPSS, it was also noted that adoption of KEPSS has also led to automation of services thus leading to downsizing in the organisation and thus positive performance. Thus study concludes that adoption of KEPSS technology had a positive influence on the financial performance of commercial banks in Kenya.

The study revealed that management efficiency is an important factor influencing financial performance, a slight decrease in operational efficiency could lead to very high reduction in profits, and thus the study concludes that management efficiency is crucial in ensuring positive financial performance of commercial banks in Kenya.

The study established that that quality of the assets and the financial performance of banks are strongly and positively correlated and that an increase in the quality of the assets would lead to significant growth in the financial performance of commercial banks, Thus study concludes that increase in the quality of the assets had a positive influence on the financial performance of commercial banks in Kenya.

The financial performance of the commercial banks in Kenya is highly dependent on the level of the institutions' liquidity. There is also a negative association between high levels liquidity and

financial performance of commercial banks. This explains the need to keep liquidity level at considerable rate in order to increase efficiency in the sector's operations. This is consistent with studies by Gul et al. (2011) and Dawood (2014) who concluded that there is a negative relationship between liquidity and profitability.

The results of this study are consistent with Simpson (2002), Agboola (2006), Thokor (2007), Mwangi (2007), Malhotra and Singh (2009), Githikwa (2009), Nofie (2011), and Thokor (2007) who have pointed out that there is a positive relationship between financial innovation and financial performance. However the results are inconsistent with studies previous studies by Prager (2001) Folkeringa et al. (2003), Frascosa and Claeys (2010), and Nader (2011) and McAndrews (2002) who concluded that innovations have negative effects on performance.

However some studies concluded that financial innovations had least impact on bank performance Frascosa and Claeys (2010). It is important to note that according to Aghion et al. (2005) the extraordinary profits will dwindle as innovations are widely adopted.

5.4 Recommendations

Based on the research findings the study recommends that commercial banks should continue investing in ATMs as this was found to have positive influence on financial performance. It is also vital that financial institutions intensify on distribution of ATM machine in order to ensure better customer service. The study recommends that financial institutions should continue in convincing their customers on more utilization of KEPSS as this strategy was found to be positively related with financial performance.

As noted operational efficiency contributes to increased financial growth and performance. Therefore improvements in operational efficiency should therefore be facilitated through

application of modern technology and innovative operational strategies to effectively bring about better financial performance in the commercial banks in Kenya.

The findings revealed that quality of the assets is directly related to the financial performance of commercial banks in Kenya today. More investments should therefore be done through establishing more banking networks across the country which is relates positively with their financial performance.

As the findings illustrated, financial performance commercial banks in Kenya is highly dependent on the level of the institutions' liquidity. To facilitate favorable financial performance in commercial banks in Kenya, there is need to formulate strategies to facilitate credible levels of liquidity so as to ensure efficiency in financial operations.

5.5 Limitations of the Study

Due to finance and time constraints, the research was limited to only commercial banks in Kenya to generalize the results for a larger group, the study should have involved a larger area of study, may be in other sectors of the economy or in other areas of the country.

There was the challenge of accessing monthly profit before tax figure as the CBK only publishes the annual banking sector reports; hence the research was based on annual banking sector reports.

The research was limited two forms of financial innovations as the independent variables affecting the financial performance of commercial banks; number of ATMs and number of transactions made using the KEPSS.

There was a limitation on the timeline of the study. The time frame of the study was for a period of 4 years. This meant the data used for the analysis was only from a 4 years period. Using a larger timeline would mean more data for further analysis.

The study was limited in that it looked at only one dependent variable. The study did not look at the effect of financial innovations on other economic variables.

5.6 Suggestions for Further Studies

The study sought to establish the effect of financial innovation on the financial performance of commercial banks in Kenya. Further research should also be undertaken which would include firms in various sectors of the economy and compare the different experiences created to these institutions due to the influence of the financial innovation.

There is need for future studies to consider obtaining monthly financial performance data rather than annual data. This was not possible during this study as CBK only provided annual data on the financial performance of commercial banks in Kenya.

Future studies should also consider studying other forms of financial innovations especially agency banking. There has been significant growth of agency banking hence the need for scientific studies to establish its effect on financial performance of the financial services sector.

There is need for future studies to consider looking at the various financial innovations and the effect on financial performance over a longer time frame. This would allow more data for further analysis.

Future studies should consider looking at various dependent variables rather than limiting the studies to profitability. The studies could analyze the effect of financial innovation on the return on equity (ROE).

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APPENDICES

Appendix I: ATMS, KEPSS and PBT Values.

a) The monthly number of ATM Machines

The Number of ATM Machines	
Month, Year	Number of ATM Machines
Dec, 2014	2613
Nov, 2014	2609
Oct, 2014	2596
Sep, 2014	2595
Aug, 2014	2597
Jul, 2014	2602
Jun, 2014	2618
May, 2014	2598
Apr, 2014	2609
Mar, 2014	2595
Feb, 2014	2507
Jan, 2014	2501
Dec, 2013	2487
Nov, 2013	2488
Oct, 2013	2480
Sep, 2013	2478
Aug, 2013	2472
Jul, 2013	2447
Jun, 2013	2439
May, 2013	2426
Apr, 2013	2413
Mar, 2013	2397
Feb, 2013	2404
Jan, 2013	2390
Dec, 2012	2381
Nov, 2012	2361
Oct, 2012	2339
Sep, 2012	2311
Aug, 2012	2295
Jul, 2012	2283
Jun, 2012	2291
May, 2012	2282
Apr, 2012	2272

Mar, 2012	2252
Feb, 2012	2236
Jan, 2012	2224
Dec, 2011	2205
Nov, 2011	2186
Oct, 2011	2185
Sep, 2011	2217
Aug, 2011	2208
Jul, 2011	2202
Jun, 2011	2183
May, 2011	2171
Apr, 2011	2162
Mar, 2011	2151
Feb, 2011	2143
Jan, 2011	2106

Source: CBK rates and statistics annual reports.

a) The Number of Transactions made using KEPSS

Kenya Electronic Payment and Settlement System (KEPSS)	
Month, Year	Volume: Number of transactions
Dec, 2014	260441
Nov, 2014	212340
Oct, 2014	237027
Sep, 2014	223227
Aug, 2014	206937
Jul, 2014	214091
Jun, 2014	198052
May, 2014	209019
Apr, 2014	200151
Mar, 2014	202035
Feb, 2014	181123
Jan, 2014	180897
Dec, 2013	180926
Nov, 2013	176330
Oct, 2013	185920
Sep, 2013	165175
Aug, 2013	164650
Jul, 2013	185773

Jun, 2013	152310
May, 2013	181045
Apr, 2013	162432
Mar, 2013	140781
Feb, 2013	144248
Jan, 2013	138297
Dec, 2012	142867
Nov, 2012	137975
Oct, 2012	157020
Sep, 2012	130874
Aug, 2012	135243
Jul, 2012	134391
Jun, 2012	127147
May, 2012	137135
Apr, 2012	115514
Mar, 2012	125739
Feb, 2012	116990
Jan, 2012	107230
Dec, 2011	117916
Nov, 2011	112923
Oct, 2011	113658
Sep, 2011	118798
Aug, 2011	110498
Jul, 2011	103338
Jun, 2011	107063
May, 2011	103112
Apr, 2011	88168
Mar, 2011	103986
Feb, 2011	84448
Jan, 2011	77625

Source: CBK rates and statistics annual reports.

b) Banking Sector Profits' Before Tax

The Banking sector Profits Before Tax	
Year	Value- Kes (Millions)
2011	88,478
2012	106,996
2013	124,547
2014	139,861

Source: CBK bank supervision annual reports.

Appendix II: List of Commercial Banks in Kenya

1. African Banking Corporation Limited
2. Bank of Africa Kenya Limited
3. Bank of Baroda (K) Limited
4. Bank of India
5. Barclays Bank of Kenya Limited
6. CfC Stanbic Bank Limited
7. Charterhouse Bank Limited
8. Chase Bank (K) Limited
9. Citibank N.A Kenya
10. Commercial Bank of Africa Limited
11. Consolidated Bank of Kenya Limited
12. Co-operative Bank of Kenya Ltd
13. Credit Bank Limited
14. Development Bank of Kenya Limited
15. Diamond Trust Bank Limited
16. Dubai Bank Kenya Limited
17. Ecobank Kenya Limited
18. Equatorial Commercial bank Limited
19. Equity Bank Limited
20. Family Bank Limited
21. Fidelity Commercial Bank Limited
22. Guaranty Trust Bank (K) Limited
23. First Community Bank Limited

24. Giro Commercial Bank limited
25. Guardian Bank Limited
26. Gulf African Bank Limited
27. Habib Bank A.G Zurich
28. Habib Bank limited
29. Imperial Bank Limited
30. I & M Bank Limited
31. Jamii Bora Bank Limited
32. Kenya Commercial Bank Limited
33. K-Rep Bank Limited
34. Middle East Bank (K) Limited
35. National Bank of Kenya Limited
36. NIC Bank Limited
37. Oriental Commercial bank Limited
38. Paramount Universal bank Limited
39. Prime Bank Limited
40. Standard Chartered Bank Kenya Limited
41. Trans-National Bank Limited
42. UBA Kenya Limited
43. Victoria Commercial Bank Limited

Source: Central Bank of Kenya Annual Supervisory Report (2014)