FINANCIAL INNOVATION AND ITS EFFECT ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

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DECLARATION

This project is my original work and has not been submitted to any institution or university for examination.

Signed: ………………………………… Date: ………………………………

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This research project has been presented for examination with my approval as university supervisor

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Mirie Mwangi

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DEDICATION

My loving family.

Your unconditional love, support and encouragement has been guaranteed throughout the entire period of study.

My friends

Your emotional and moral support has been steadfast. May God bless you.

ABSTRACT

The purpose of the study was to assess the effect of financial innovation on commercial bank's financial performance as the key players in the banking sector over a period of 4 years. Kenya's financial sector has undergone significant transformation in the last few years. Many new more efficient and real time financial systems have come into place. Despite the undeniable importance of financial innovation, its effect on financial performance is not always obvious since there are reported cases of reverse causality between innovation and performance.

The causal research design was used to carry out this study. The population of study was all the 43 commercial banks in Kenya as at 30th June 2012. The study used secondary data from published central banks' annual reports. The independent variable was financial innovations unique to commercial banks while dependent variable was consolidated financial performance of all banks.

Study results indicated that financial innovation indeed contributes to and is positively correlated to profitability in the banking sector particularly that of commercial banks. This is further supported by high uptake of more efficient financial systems in substitution for the less efficient traditional systems. This is evidenced by the negative correlation between Real Time Gross Settlement and Automated Clearing House (Cheques & EFTs) throughput over time; as well as that of profitability and Automated Clearing House throughput.

Development of more efficient payment systems, with adequate regulation, should therefore be encouraged for improved financial performance and faster economic growth.

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ABBREVIATIONS

ACH	-	Automated Clearing House
ARM	-	Adjustable-Rate Mortgage
ATM	-	Automated Teller Machine
CBK	-	Central Bank of Kenya
CD	-	Certificate of Deposit
CEO	-	Chief Executive Officer
CRM	-	Customer Relationship Management
DFID	-	Department of International Development
DTM	-	Deposit-Taking Microfinance Institution
EFInA	-	Enhancing Financial Innovation and Access
EFT	-	Electronic Funds Transfer
FAQ	-	Frequently Asked Question
GDP	-	Gross Domestic Product
ICT	-	Information and Communications Technology
KCB	-	Kenya Commercial Bank
KEPSS	-	Kenya Electronic Payments and Settlement System
MFC	-	Mortgage Finance Company
MICR	-	Magnetic Ink Character Recognition
NBI	-	Non Banking Financial Institution
ROA	-	Return on Assets
ROE	-	Return on Equity
RTGS	-	Real Time Gross Settlement
PAT	-	Profit after Tax
PATEI	-	Profit after Tax and Exceptional Items
SCF	-	Survey of Consumer Finance
SPSS	-	Statistical Package for Social Sciences

INTRODUCTION

1.1 Background of Study

Financial services firms provide the payment services and financial products that enable households and firms to participate in the broader economy. By offering vehicles for investment of savings, extension of credit, and risk management, they fuel the modern capitalistic society. While the essential functions performed by commercial banks have remained relatively constant over the past several decades, the structure of the industry has undergone dramatic change. Liberalized domestic regulation intensified international competition, rapid innovations in new financial instruments, and the explosive growth in information technology fuel this change (Tidd & Hull, 2003).

With this change has come increasing pressure on managers and workers to dramatically improve productivity and financial performance. Competition has created a fast-paced industry where firms must change in order to survive. Financial innovation in the banking industry has been spurred on by the forces described by Noyer (2007) particularly in terms of new distribution channel systems, such as internet and mobile banking. As the industry has provided more ways for consumers to access their accounts, they have added significant costs to each institution. A need to combat these costs resulted in a major cost savings period, where many banks successfully got much of the cost out of the back office. These cost savings came largely through back office automation, which is a technological innovation that has recently been completed. Now, after adding significant costs through added distribution channels and cutting as much as possible in the back office, banks have realized that the key to profitability is through revenue enhancement (Cainelli et al,

2004). Banks are now forced to consider new ways to drive revenue through their distribution system. The most common way to classify this is through the drive to increase the customer share of wallet. The share of wallet is the portion of a customer's entire financial relationship that any particular bank has with the customer.

The primary revenue-enhancing innovations occurring today are in platform automation for branch and phone center employees, and in the newest distribution channel, internet and mobile banking. While these innovations have aspects in common, they each 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). The developments in the financial sector have not only led to the increase in the number of financial institutions, but also the development in level of sophistication with new payment systems and asset alternatives to holding money. This has resulted mainly from technological advancement and increase in competition as the number of institutions increase. Developments in payment systems have started to create close substitutes for hard currency, thus affecting a core part of banking.

This is, for example, the case with the use of debit and credit cards, which have also increased steadily from the late 1990s. They have facilitated the use of electronic means of payment and sometimes substituted for the use of physical cash. More importantly, payment cards have also enabled the issuance of electronic money (e-

money), which not only directly rivals physical cash in small value payments but also bank deposits through holding e-money balances (Buchs, T. & Mathisen, 2005). This reduces the amount of money that an individual can hold at hand at any particular time, thus affecting the demand for money. As these cards and e-money balances, e.g., M-Pesa balances, gain wider acceptability, demand for money and even motives for holding cash change significantly with implications on monetary policy transmissions.

Other innovations in the banking sector include: increased use of paper money instead of cash. Cheques are the main paper based mode of payment accounting for 48% of non-cash payments. Use of Magnetic Ink Character Recognition (MICR) ensures clearing of cheques speedily and efficiently. The Central Bank of Kenya launched a Real Time Gross Settlement (RTGS) system known as the Kenya Electronic Payments and Settlement System (KEPSS) in July 2005 in an effort to modernize the country's payment system in line with global trends (Oloo, 2007). Other financial innovations include mobile banking and internet banking.

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. Such developments affect the speed and strength of the channels of monetary policy transmission mechanism in the economy. As financial markets become more liquid and complete, changes in official interest rates are more readily transmitted to the whole term structure and more generally to financial asset prices.

1.1.2 Financial Performance

Firm performance is a multidimensional construct that consists of four elements (Alam et al. 2011). Customer-focused performance, including customer satisfaction, and product or service performance; financial and market performance, including revenue, profits, market position, cash-to-cash cycle time, and earnings per share; human resource performance, including employee satisfaction; and organizational effectiveness, including time to market, level of innovation, and production and supply chain flexibility.

Consistent with the theoretical foundations in the capabilities and resource-based perspectives, it is argued that organizational capabilities are rent-generating assets, and they enable firms to earn above-normal returns. For example, performance management capability influences various measures of firm performance by allowing business leaders to review and take corrective actions on any potential or actual slippages proactively and in a timely manner (Athanasoglou et al, 2008). Likewise, prior studies in marketing and strategy argue that customer management capability (Alam et al, 2011) and process management capability (Ahmad et al, 2011) influence several dimensions of firm performance.

Financial performance measures how well a firm is generating value for the owners. It can be measured through various financial measures such as profit after tax, return on assets (ROA), return on equity (ROE), earnings per share and any market value ration that is generally accepted. Generally, the financial performance of banks and other financial institutions has been measured using a combination of financial ratios analysis, benchmarking, measuring performance against budget or a mix of these methodologies (Ahmad et al, 2011). The financial statements of financial institutions

commonly contain a variety of financial ratios designed to give an indication of the corporation's performance. Simply stated, much of the current bank performance literature describes the objective of financial organizations as that of earning acceptable returns and minimizing the risks taken to earn this return (Alam et al, 2011). There is a generally accepted relationship between risk and return, that is, the higher the risk the higher the expected return. Therefore, traditional measures of bank performance have measured both risks and returns.

The increasing competition in the national and international banking markets, the change over towards monetary unions and the new technological innovations herald major changes in banking environment, and challenge all banks to make timely preparations in order to enter into new competitive financial environment. Aburime (2009) investigated the effectiveness of Nigerian banks based on their political affiliation. The study found that political factors were a major determinant of performance of Nigerian banks.

Profit after tax has been widely used as measures of banks' performance. Regarding factors affecting bank performance, different factors have been used by researchers such as: shareholders' equity; liquid assets to assets; total loans to total deposits; fixed assets to total assets; total borrowed funds to total assets; reserves for loans to total assets; market concentration; the market size; labor productivity; bank portfolio composition; capital productivity, bank capitalization; financial interrelation ratio; the level of capitalization; age of the bank; per capita Gross Domestic Product (GDP), the cost to-income ratio and customer satisfaction (Athanasoglou et al, 2008). Financial performance of banks is usually expressed as a function of internal and external determinants. The internal determinants originate from bank accounts (balance sheets

and/or profit and loss accounts) and therefore could be termed micro or 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. A number of explanatory variables have been proposed for both categories, according to the nature and purpose of each study (Alam et al, 2011).

Studies dealing with internal determinants employ variables such as size, capital, risk management and expenses management, human resource and bank innovativeness. External determinants of bank profitability include factors such as inflation, interest rates and cyclical output, and variables that represent market characteristics (Alam et al, 2011). The latter refer to market concentration, industry size and ownership status of the banks. This study will relate financial innovation and financial performance and seek to find whether the two variables are related.

1.1.3 Financial Innovation and Financial Performance

Theories concerning advantages of financial innovation have typically evolved out of the Schumpeterian argument that new products and processes developed by a firm are protected from imitation for a certain period. A successful innovation thus generates a proprietary competitive position that bestows on the firm a competitive advantage and superior performance (Lyons, Chatman & Joyce, 2007). The imitation that occurs during the Schumpeterian process of creative destruction then generates the need for enterprises to produce still more innovations in order to maintain a competitive advantage.

Lyons, Chatman & 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 bank services. They cite ATMs (automated teller machines), telephone banking, internet banking, and e-money as being among the significant innovations affecting the banking distribution system that influence banking performance significantly. Mansury & Love (2008) add that client relation management systems, bank management technologies, and various other technologies are among the major changes in internal banking systems that also have exercised a positive influence on banking performance and profitability.

1.1.4 Kenyan Banking Sector

The Banking sector in Kenya is governed by multiple rules such as the Companies Act, the Banking Act, the Central Bank of Kenya Act and various prudential guidelines and policies issued by the Central Bank of Kenya (CBK) (CBK, 2009). Reforms in the banking sector started in 1994 with failure of several banks in Kenya. The financial sector in Kenya was finally liberalized in 1995 where exchange controls and other control regimes were lifted.

As at 31st December 2010, the banking sector comprised of the Central Bank of Kenya, as the regulatory authority, 44 banking institutions (43 commercial banks and 1 mortgage finance company), 2 representative offices of foreign banks, 5 Deposit-Taking Microfinance Institutions (DTMs) and 126 Foreign exchange Bureaus. Thirty one of the banking institutions are locally owned while 13 are foreign owned. The locally owned financial institutions comprise of 3 banks with public shareholding, 27 privately owned commercial banks, 1 mortgage finance company (MFC) while 5

Deposit taking Microfinance Institutions and 126 foreign exchange bureaus are privately owned.

The banking sector has reported massive growth and development in recent years. This is attributable to the effective regulation and reforms effected by the central bank after many banks went into bankruptcy in the 1990s, much of the growth in the banking sector has been witnessed in branch network expansion, growth in capitalization and asset base and the expansion of some of the banks regionally. The banks have also been in the frontline of automating their functions to give their customers good service. Kenyan banks have engaged in product innovation where internet banking and mobile banking have taken root in various local banks. As the Kenyan financial market is expanding, banks have realized that they are facing more and more competition form other thus forcing them to increase their marketing spend, lower charges such as lending rates and increase their presence (CBK, 2010).

1.1.5 Financial Innovation in the Kenyan Banking Sector

Kenya's financial sector has undergone significant transformation in the last few years. The financial infrastructure has slowly come into place, the market response has been swift and economic activity has supported growth. In the last 6 or so years, we have seen significant decline of barriers to entry to the financial sector, significant decline in cost of maintaining micro accounts, the introduction of new instruments targeting lower segments of the population and increased branch network of branches across the country (Njuguna, 2011).

Central Bank of Kenya has provided space for innovative solutions. First is the innovation in mobile phone financial services platform. Use of mobile phones for

person to person, person to business, business to person and ATM payment transfers have increasingly taken off and many banks are offering such services. Agent banking is another innovation in the banking sector. This is where non-bank outlets are turned into financial services providers. By 2011 there were 8,809 agents approved, leveraging on mobile phone money agents (CBK, 2011). These agents have pushed forward the financial inclusion frontiers.

In 2009 mobile phone platforms began being integrated with banking platforms. One of the criticisms then was that mobile phone money transfers did not seem to affect financial intermediation significantly. However, In May 2010, Equity Bank Ltd partnered with Safaricom to launch M-Kesho account that went beyond transfers to micro-savings, micro-credit and micro-insurance. Since the launch, over 786,000 M-Kesho accounts have been opened with over USD 8.5 million mobilized. Other banking products that leverage on mobile phone technology include KCB Bank Connect and Family Bank's PesaPap product (Njuguna, 2011). Other mobile phone operators have also launched their mobile money products −Airtel (Airtel Money), Essar (Yu Cash) and Telkom (Orange Money). These mobile money transfer services have been integrated with bank systems to coordinate transactions between the mobile phone and bank account (CBK, 2011).

Financial systems innovations include RTGS, a Kenya Electronic Payment and Settlement System in which both processing and final settlement of fund transfer transactions take place on an item by item (gross) basis continuously throughout a business day. It is an on-line system that facilitates the transfer of high value and/or time critical payments between participants in real time

and aims at enhancing efficiency by reducing inherent risks in traditional payment System such clearing house (CBK, 2011).

1.2 Statement of the Problem

Despite the undeniable importance of financial innovation in explaining banking performance, the impact of innovation on performance, is still misunderstood for two main reasons. Athough studies have been carried out on the contribution of financial innovation to the effectiveness of the monetary policy; few studies have sought to relate financial innovation to financial performance in the banking sector. Most of the existing studies also adopt a simplistic approach to the innovation-performance relationship which does not take into account the antecedents to innovation inside and outside the banking organization, all of which could influence this relationship.

Furthermore, in spite of an extensive descriptive literature on financial innovation, there is a paucity of empirical studies on financial innovation and its effect on performance of the innovators. Most of the existing empirical works have focused on the same handful of financial innovations (Tidd & Hull, 2003). Noyer (2007) states that despite a growing literature developed on financial innovation; these are mainly innovations of securities on financial markets. To better apprehend the financial innovation process within the banking firm, this study intend to study the two types of financial innovation most commonly cited by the literature review, namely: product innovation and financial services innovation. Financial innovation has been indicated to affect economic growth and financial inclusion as well as boost the financial performance of commercial banks (CBK, 2011). Studies on financial innovation have been based other financial markets with little emphasis on the banking sector.

This study therefore aimed at filling this gap by answering the following research question: What is the effect of financial innovation on the financial performance of commercial banks in Kenya?

1.3 Objective of the Study

The objective of the study was to assess the effect of financial innovation, particularly payment systems, on financial performance of commercial banks in Kenya. It further sought to test the correlation between output of two payment systems; Automated Clearing House and Real Time Gross Settlement , and banking sectors profitability.

1.4 Value of the Study

The study findings will prove to be important to commercial banks in Kenya, other organizations in the country, policy makers in banking and financial services and in scholarship.

This study will add more knowledge on the concept of financial innovation and give more empirical findings on the relationship between financial innovation and performance. This will provide more literally material which will be of value to scholars, students and researchers. This study can also be used as a basis of further research and also in academics in the area of financial innovation and deepening in developing nations.

This study will provide more insight on the effect of financial innovation on performance. This will provide management of commercial banks and firms in financial services with more insight on the importance of financial innovation not only to the economy but to the banks's performance.

The findings can further be applied by policy makers in the area of financial services innovation and banking. Financial innovations are touted as the way to improve financial inclusion to drive economic development towards attainment of vision 2030. Policy makers can hence use the study findings to design policies that will encourage financial innovation but at the same time instilling effective regulatory environment.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The review of literature in this section covers theoretical framework and empirical studies that have been carried out in the area of financial innovation in the banking sector. The study delves onto the drivers to financial innovation and how this affects the innovators in form of financial performance.

2.2 Theoretical Review

Several theories have been designed by different scholars to explain financial innovation. This study will be guided by five major theories. These include constraint-induced financial innovation theory, circumvention innovation theory, regulation innovation theory, transaction cost innovation theory and location theory.

Silber (1983) advanced constraint-induced financial innovation theory. This theory pointed out that the purpose of profit maximization of financial institution is the key reason of financial innovation. There are some restrictions (including external handicaps such as policy and internal handicaps such as organizational management) in the process of pursuing profit maximization. Though these restrictions not only guarantee the stability of management, they reduce the efficiency of financial institution, so financial institutions strive toward casting them off. Constraint-induced innovation theory discusses financial innovation from microeconomics, so it is originated and representative. But it emphasizes "innovation in adversity" excessively. So it can't express the phenomenon of financial innovation increasing in the trend of liberal finance commendably.

Kane (1981) is the pioneer of circumventation innovation theory. He postulated that 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, so the market innovation and regulation innovation should be regarded as the continuous fighting process between independent economic force and political force. Because financial industry is special, it has the stricter regulations. Financial institutions deal with the status such as the reduction of profit and the failure of management induced by government regulations in order to reduce the potential loss to the minimum. Therefore, financial innovation is mostly induced by the purpose of earning profit and circumventing government regulations. Kane's theory is different from the reality. The regulation innovation he assumed is always towards the direction of reinforcing regulation, however, the regulation innovation in reality is always towards the direction of liberal markets innovation, the result of the game is release of financial regulation and markets become more liberal. This theory not only considered the origin of innovation in the market but also explained the process of regulation innovation and their dynamic relation.

Regulation innovation theory was put forward by Scylla et al (1982). It explains financial innovation from the perspective of economy development history. The theory proposes that financial innovation connects with social regulation closely, and it is a regulation transformation which has mutual influence and has mutual causality with economic regulation. Scylla et al thought that it is very difficult to have space of financial innovation in the planned economy with strict control and in the pure free-market economy, so any change brought about by regulation reform in financial system can be regarded as financial innovation. The Omni-directional finance

innovative activities can only appear in the market economy controlled by government. When government's intervention and the management have hindered the finance activities, there will be many kinds of financial innovation which intend to circumvent or get rid of government controls. The game between the market and government finally form the spiral development process, namely, "control-innovate, controls again-innovates again". In this theory which expanded the scope of financial innovation, government activity is also regarded as the origin of financial innovation. But it regards regulation innovation as one part of financial innovation. Especially, it regards rules and regulations which are used to control as financial innovation. The financial control is the obstructive force of financial innovation, so rules and regulations which are regarded as the symbol of financial control should be the direction of financial reform and innovation.

The transaction cost innovation theory's main pioneers are Hicks & Niehans (1983). They thought that the dominant factor of financial innovation is the reduction of transaction cost, and in fact, financial innovation is the response of the advance in technology which caused the transaction cost to reduce. The reduction of transaction cost can stimulate financial innovation and improvement in financial services. This theory studied the financial innovation from the perspective of microscopic economic structure change. It thought that the motive of financial innovation is to reduce the transaction cost. And the theory explained from another perspective that the radical motive of financial innovation is the financial institutes' purpose of earning benefits. This theory discussed the motive and the process of financial innovation from different sides.

Desai & Low (1987） with the location theory thought that financial innovation is the method which can make the integrity of financial market come true. According to the Location Theory, they advanced the financial innovation microscopic economic model. Desai & Low (1987) utilized this theory to confirm and measure the gap in the scope of acquirable product in financial market, which indicates the potential opportunity of the new products' innovation and promotion.

Chen (1995) built the financial intermediacy model in which new security secured by old security is created. In the period of decomposing the old securities and opening new market, innovators play an influential economical role. For example, investors can obtain the consumption at lower cost; investors can realize a better share of risks. His model indicated that even when introducing the surplus securities which are not distributed yet, the innovators can also play these roles. In other words, although these innovations have not changed the scope of acquirable financial tools, it makes investor's trade at lower expected cost. The main focus is on security designing in incomplete financial markets. These theories will be applied to point in the way of explaining financial innovation in Kenya.

2.3 Financial Innovation and Financial Performance

Financial innovations can be grouped as new products (such as adjustable rate mortgages and exchange-traded index funds); new services (such as on-line securities trading; Internet banking and mobile banking); new "production" processes (such as credit scoring); or new organizational forms such as agency banking and Internet-only banks (Hayashi & Klee, 2003).

Innovation is clearly an important phenomenon in any sector of a modern economy. Financial innovation over the years has made the financial sector to have new and innovative products and services. A partial list of major innovations in developed economies over the years would include, negotiable CDs, Eurodollar accounts, Eurobonds, sushi bonds, floating-rate bonds, puttable bonds, zero-coupon bonds, stripped bonds, options, financial futures, options on futures, options on indexes, money-market funds, cash-management accounts, income warrants, collateralized mortgages, home equity loans, currency swaps, floor-ceiling swaps, exchangeable bonds, and many others (Hayashi & Klee, 2003).

Financial performance is the profitability of a business enterprise measured through various measures mostly return on assets and return on equity. Profit-seeking enterprises and individuals are constantly seeking new and improved products, processes, and organizational structures that will reduce their costs of production, better satisfy customer demands, and yield greater profits. Sometimes this search occurs through formal research and development programs; sometimes it occurs through more informal "tinkering" or trial and error efforts. When successful, the result is an innovation. The consequences of financial innovation in terms of the pay-offs to the innovators and the impact on society as a whole has been a subject for theoretical literature. Innovation generally does seem to have positive effects in raising financial performance of innovators (Boot, A. & Thakor,2007)

Financial innovation can be critical in overcoming the two main challenges that financial intermediation faces in developing countries: the high costs and the high risks (Gitonga, 2003). For instance mobile banking relies to a greater extent on variable rather than fixed costs, which implies that even customers who undertake

small and few transactions are viable or bankable relative to banking through conventional channels. Second, trust can be built much more easily by reducing the risk from the customer's and the provider's viewpoint. Financial innovation can thus be critical in helping reduce the large share of population that is currently unbanked. Similarly, new institutions and new products can help overcome the challenge of long-term financing (Lerner, J., 2006).

Financial innovation comes about mainly through incumbent financial institutions which are rarely interested in innovating unless forced to do so by competitive pressure. Africa's banking systems, however, are mostly small and of limited competitiveness. Second, financial innovation cannot be introduced per regulation. It is introduced by market players – mostly private, though not always profit-oriented .

2.4 Empirical Review

Schumpeter (1934) is often credited with the initial idea that innovations can lead to competitive advantage that can be exploited by innovative firms. Following this, a substantial body of research suggests that the relationship between a firm's level of innovation and financial performance should be positive. For example, a study by Stavins (2011) in US on community banks studied the effect of consumer characteristics on the use of payment instruments. It indicated that consumers differed on how they used payment options depending on gender, size of transactions and occupation. The study further established that community banks that adopted many payment options did better than their peers. This shows that innovation provides firms with commercially superior products, better mechanisms to cope with environmental uncertainties, and an increased ability to create new resource configurations (Stavins, 2011). This study further revealed that in the short-term, innovative firms can capture

early mover advantages such as securing relationships with key suppliers, carving out attractive market share and forging customer loyalty. In the longer term, innovative firms can influence regulatory regimes and have strategic competitive advantages that their peers.

Concerning products and services, mortgage loans are one set of products that have experienced a great deal of change globally. Around 1980s, long-term fully amortizing fixed-rate mortgages were the norm. These products were offered primarily by thrift institutions. Moreover, these loans required substantial down payments and a good credit history; and the accumulated equity was relatively illiquid. These characteristics have markedly evolved (Hicks, D. & Niehans J., 1983).

The first big change occurred in the early 1980s with the widespread introduction of various types of adjustable-rate mortgages (ARMs), which had previously been banned by regulators. One mortgage innovation more directly tied to technological change is subprime lending, which was originally predicated on the use of statistics for better risk measurement and risk-based pricing to compensate for these higher risks. However, the subprime mortgage crisis has uncovered significant shortcomings in the underlying statistical models (Hicks, D. & Niehans J., 1983).

A study by Crews-Cutts & Van Order (2005) in US mortgage market indicated that subprime mortgage lending acts to expand the pool of potential homeowners and helped to lead the U.S. to a record homeownership rate in 2004 of 69.2% even in the face of declining housing affordability in many areas of the country. On the other hand, subprime mortgages typically come with more onerous terms, like higher interest rates and prepayment penalties. This affords more income to mortgage

institutions. Crews-Cutts & Van Order (2005) explain various stylized facts pertaining to subprime loan pricing and performance in the context of financial contracting theory. Another empirical study by Chinloy & Macdonald (2005) in the US mortgage financiers indicated that the subprime market helps to complete the credit supply schedule and therefore enhance the financial institutions earning potential.

Recent service innovations primarily relate to enhanced account access and new methods of payment – each of which better meets consumer demands for convenience and ease. A study in the Australian corporate banking sector indicated that having innovative and differentiated products made commercial banks attract more corporate clients (Cainelli et al, 2004). Cohen (1995) in his study in the British banking sector found that Automated teller machines (ATMs), which were introduced in the early 1970s and diffused rapidly through the 1980s, significantly enhanced retail bank account access and value by providing customers with around-the-clock access to funds. ATM cards were then largely replaced through the 1980s and 1990s by debit cards, which bundle ATM access with the ability to make payment from a bank account at the point-of-sale. Over the past decade, remote access has migrated from the telephone to the personal computer. Online banking, which allows customers to monitor accounts and originate payments using "electronic bill payment," is now widely used. Stored-value, or prepaid, cards have also become the norm.

According to ATM & Debit News (2007), there were approximately 26.5 billion debit transactions in the U.S. during 2006. This is up from 6.5 billion transactions in 1999 – a four-fold increase. Much of the research pertaining to debit cards relates to identifying the most likely users of this payment instrument. Such demand-side explorations have been conducted individually as well as jointly across multiple

payment options. Stavins (2011), for example, used data from the 2008 Survey of Consumer Finances (SCF) and finds that debit usage is positively related to educational attainment, homeownership status, marital status, business ownership, and being a white collar worker; and is also positively related to amount of transactions with a bank.

Telephone and online banking are other ways that banks have innovated. As households and firms rapidly adopted Internet access during the late 1990s, commercial banks established an online presence. According to DeYoung (2005), the first bank websites were launched in 1995; and by 2002 nearly one-half of all banks and thrifts operated transactional websites. As of 2011, bank call report data suggests that 77.0 percent of commercial banks offer transactional websites (and these banks control 96.8 percent of commercial bank deposits). The primary line of research relating to online banking has been aimed at understanding the determinants of bank adoption and how the innovation has affected bank performance. In terms of online adoption, Furst et al (2002) find that U.S. national banks (by the end of the third quarter of 2008) were more likely to offer transactional websites if they were: larger, younger, affiliated with a holding company, located in an urban area, and had higher fixed expenses and non-interest income.

On online bank performance, DeYoung, Lang, & Nolle (2007) report that Internet adoption improved U.S. community bank profitability – primarily through deposit-related charges. In a related study, Hernando & Nieto (2007) find that, over time, online banking was associated with lower costs and higher profitability for a sample of Spanish banks. Both papers conclude that the Internet channel is a complement to, rather than a substitute for, physical bank branches. Any implementation of Internet

banking requires information technology investment by Internet banking service providers. To succeed in such investments, bank customers must see value in the technology, or they are unlikely to use it much. In some areas, things have not moved as quickly as some anticipated in turning these benefits into reality in the banking sector, and many bank customers still hesitate in switching to web-based service transactions.

An important question about business investment in innovation today is whether the expected financial benefits can be realized. Many studies attempt to evaluate the impacts of investing in innovation. Tufano (2003) proposed that impacts should be observed at each strategic business unit level. They use two-stage analysis to determine the value of investment in innovation: intermediate and high level output variables for measuring the innovation contribution. They analyze intermediate-level variables based on factors such as innovation utilization, inventory turnover, quality, price, and new products, while high level variables or final performance variables are measured by market share and return on assets. They also suggest that innovation value should be measured at the process level at which innovation is implemented.

Krugman (2007) explored both market and process-level factors, to evaluate barriers to electronic commerce investment. His findings which were based on major US banks indicated that regulation was a major barrier to innovation. Another longitudinal study on Brazilian financial institutions indicated that IT creates value flows that occur internally such as cost savings, product quality, and innovative service or product (Berger, 2003).

Akhavein et al (2005) proposed a model for assessing the business value of e-banking distribution channels which applies five perspectives: customer, marketing, finance, technology, and strategy perspectives. These perspectives were used to evaluate business value along two viewpoints, internal and external. The internal view means that the e-banking distribution channel is considered as a resource providing efficiency, effectiveness, market expansion, and competitive advantages to the financial service provider. Business value from the external view derives from the customer viewpoint, and is measured by the extent to which the e-banking channel supports the relationship between the bank and its customer. In their study on the diffusion of financial innovation through an examination of the adoption of small business credit scoring by large banking organizations in Latin America, Akhavein et al (2005) established that large banks that adopted small business credit scoring performed well financially than those banks that used conventional ways.

A study by Claessens & Laeven (2003) on multinational banks in Denmark found that four factors influencing adoption of the Internet and other technology to design new products and services are aggressive technology policy, compatibility of the technology with organization culture and infrastructure, top management support, and potential advantage. Prior studies about business use of mobile and web technology (Hayashi & Klee, 2003) showed that these technologies provides a number of information benefits, as businesses use the Internet and other Information Communications Technology (ICT) channels to provide information about product specifications, price, and service delivery methods. Specific informational benefits include quality information, easier access to information, and capabilities for information sharing (Claessens & Laeven, 2003). The study by Hayashi & Klee (2003) on japans banks established that there are also transaction benefits, which can

provide the firm with the ability to automate business functions via the web and provide service to customers with lower costs, more responsiveness, and greater potential for customization.

Innovation has been conceptualized to bring benefits to the innovative organization and the economy as a whole. This is brought majorly by having better and more efficient service systems, better products and quality services and products. In doing business, both buyers and sellers try to minimize transaction costs. Customers perceive cost advantage if their service providers set prices lower than others without any substantial sacrifice of service quality. Cost advantage leads to superior performance if service providers can provide an acceptable level of value with lower costs to their customers.

These findings were revealed from study by Lerner (2006) on a study on small banks in Canada. According to Unger (2005), one of the major contributions of Internet-based service is the reduction in transaction costs as buyers and sellers can contact each other directly. Service providers can gain operational benefits by reducing time, overhead costs in operation, and also eliminate costly service participants such as company service personnel (Lerner, 2006). In the financial services industry, the web is used as a means of payment or money transfer. Many observers claim that this new channel reduces time and cost to both customers and banks. The web-based payment process may be perceived as more convenient, and can create saving dimensions for customers. Prior empirical research about Internet banking reveals that time and cost are key factors affecting Internet banking adoption of the bank. There may be some economies of scale involved; e.g., Unger (2005) found that cost and time saving

dimensions are perceived as a larger benefit when customers use Internet banking services more often and for larger transactions.

Offering the Internet or ICT for commercial purposes also requires that the level of service provided to customers remain much the same as is provided from a sales force in traditional marketing. This was established from a study on Spanish local banks by Hernando & Nieto (2007). Another study by Mansury & Love (2008) on US service businesses established that communications aspects of service can certainly be enhanced by the web or mobile phone, which are often used as a channel to communicate and provide support to customers in order to improve customer relations. Firms have to communicate to their customers in order to provide them with more information on related products or services which they offer.

Van Horne (1985) found that information technology provides powerful tools to communicate with customers. In research on electronic services, Tufano (2003) found that web technology provides situation-specific or personalized communication. For instance, customers can complain about a product or service in order to get their problem solved or request their specific needs and wants via multiple means (e.g. email, live chat, FAQ page), whereas the supplier or service provider can respond to customers more rapidly.

Customer service can improve by using innovative service means such as web applications and mobile phone to identify and report problems more quickly, and allow more accurate diagnosis and faster responses to firm customers. Web applications such as customer relationship management (CRM) can gather data and analyze a customer database for specific customer needs and wants so that customers

can have immediate feedback on services or products available as requested. Heffernan (2005) found that when Irish banks provided service via the web for their corporate customers, customers demanded many types of support from banks, such as after sales service support for customer training in using the Internet banking system. Further, the study established that banks succeeded in using web-based business to implement innovative new services for their customers. The new radical changes of services have led to superior offerings and provided significant economic benefits to their customers (DeYoung, 2005).

Other innovative products and services apart from web banking that contribute to the bottom-line include Prepaid Cards, Automated Clearinghouse (ACH), Small Business Credit Scoring, Asset Securitization, Risk Management and mobile banking (Noyer, 2007). Other forms of innovation applied in African and Latin America include agency banking which have made banks to improve their reach without opening new branches.

Innovation in the financial sector is key to financial inclusion according to a review on Kenyan mobile financial services (Njuguna, 2011). In Kenya, mobile banking services have been the landmark of financial innovation. The Department of International Development (DFID) gave Vodafone a grant of £1 million. This funded Safaricom (the network affiliated with Vodafone in Kenya) to create a competitive financial service, that ultimately brought 12 million people into formalized financial markets. Conventional financial services have space to be more inclusive, and can offer a viable service to those at the bottom of the pyramid (Cheney & Rhine, 2006). By expanding financial service markets it will be possible to increase the number of people who can benefit from access to formal financial services such as loans, credit

and savings accounts. However, in order to expand markets, the operations of financial service systems, and the market trends needs to be considered.

Currently, as formal banks offer typical products in order to reach beyond their current client base, they have to understand the needs of the people who are not using their services. To take this forward, the firms have to be willing to put the cash in to support innovation and expansion. There is still a great need to better understand, shape and evaluate market expansion. Competition among financial institutions is intensifying as more African countries relax barriers to entry that have brought in new players. This was revealed by Odhiambo (2008) on a study on Innovation Strategies at the Standard Chartered Bank (Kenya) Limited.

A Kenyan banking survey by Oloo (2007) revealed that the flurry of fresh entrants in some countries is credited with helping to drive down banking charges, improve access to banking services and spark off a wave of new products and services. In Kenya, where less than a quarter of the population has bank accounts (Mwangi, 2007), banks have been spurred into action in the consumer market by the success of the mobile money transfer services. Money transfer services were first launched by Kenyan mobile operator Safaricom in 2007 via M-Pesa and other mobile operators now provide similar services. This is one of the main catalysts that have triggered far-reaching changes in the country's banking and financial services landscape.

According to a study by Enhancing Financial Innovation and Access (EFInA), a non-profit organization that promotes financial inclusion, around 20% of Kenyans had bank accounts and about 8% had access to other forms of formal financial services in 2006 (Mwangi, 2007). By 2011, the percentage of people with bank accounts had

crept up to 23% but those using other formal services, particularly M-Pesa, had shot up to 19%. Today's figure is likely to be even higher because the number of M-Pesa subscribers using the service to deposit and withdraw cash and do money transfers has reportedly increased to 16 million (Mwangi, 2011). This success has galvanized banks into action. Banks now have much lower entry fees, which means that less wealthy individuals can now afford to open accounts. Further, the recent changes in legislation have also made it possible to introduce agency banking, which means banks no longer need to follow the traditional bricks and mortar model. Banks are now allowed to recruit other businesses - notably telecommunications companies and retailers with a nationwide presence - to offer banking services on their behalf on an agency basis.

One of the latest boosts for financial access in Kenya is the partnership between mobile operators and commercial banks which, over and above doing away with account-opening fees and monthly charges, pays interest and offers account holders access to emergency credit and insurance facilities (King'ori, 2008). The study by King'ori (2008) on the determinants of income velocity of money in Kenya studied financial institutions across Kenyan financial sector. Findings indicated that innovations and changes are taking over the Kenyan financial sector by storm. As a result of all these changes, the sector has become very competitive. Access to banking and financial services has improved greatly and charges are coming down. The greater circulation of money also means more businesses are coming up and helps investors feel a little bit more comfortable about investment prospects.

In this age of innovation and development, a study by Kamau (2009) on the efficiency in the Banking Sector indicated that banks need to be more innovative in their product and service offering to increase their share in the millions of consumers. African

demand for financial services will increase in future and although banks with an established African presence have an inherent advantage, they will face increasing competition not only from their traditional competitors but also from novel and innovative ways of providing financial services (Kamau, 2009). Banks have increased their presence and hence their financial performance through having innovative products and services.

In Africa, Equity Bank and Capitec Bank are both examples of banks whose strategies are specifically geared towards the mass market and innovation. Differentiation and a relentless focus on service delivery, including accessibility, have been the key to success of many banks. Many banks have realized that lower income consumers need to be treated very differently, and products and processes are designed accordingly, without ever compromising on operating performance (Kihumba, 2008). Increasing numbers of well-established banks in Africa are now exploring opportunities in lower income markets with customized and innovative products and services. For these institutions, the strategic incentives are rather different from the new-style banks. While both groups are looking to make profits, the incumbents are already (by and large) profitable in other areas, and so need to convince themselves that there is enough profit to be made in these new markets to justify the diversion of resources and management time away from the core business.

Across Africa and elsewhere, there are now numerous examples of bottom of the pyramid innovation by formal financial institutions – whether in the form of new products, reconfigured business processes, branchless banking strategies, innovative partnerships and so on (Kasekende et al, 2009). In many cases, the innovation has been highly profitable – not always material in the context of existing institution's

group profits, but sometimes exhibiting dramatic growth rates. Common to most of the successful innovators we have seen has been a commitment to getting the disciplines of service provision right, to understanding the different needs of these new customers, and having the operating space within the institution to be able do things differently with strong Chief Executive Officer (CEO) level support.

Hauner & Peiris (2005) cite ATMs (automated teller machines), telephone banking, internet banking, and e-money as being among the significant innovations affecting the banking distribution system that influence banking performance significantly. Boot & Thakor (2007) add those client relation management systems, bank management technologies, and various other technologies are among the major changes in internal banking systems that also have exercised a positive influence on banking performance and profitability. The first institutions to adopt successful new technologies earn extraordinary profits because of the high prices they impose or the increased market shares they acquire. Other banks follow their lead in order to avoid losing market share. If the process of innovation continues and new technologies are introduced over time, innovative banks can continue to earn high profits on the various new or improved products. However, extraordinary profits will dwindle as innovations are adopted widely (Aghion et al, 2005). Consistent with the results of other studies that support the hypothesis that the first mover advantage offers the enterprise better performance, the examination by Batiz-Lazo & Woldesenbet (2006) of the introduction of ATMs (Automatic Teller Machines) by American banks demonstrated that the competitive advantage and performance that is associated with it were not realized by those who subsequently adopted the technology.

In their examination of the dynamic of financial innovation in the banking industry in the U.K, Batiz-Lazo & Woldesenbet (2006) 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 a different impact on banking performance. They argue that product innovations have a market focus and are effectiveness driven, while process innovations have an internal focus and are efficiency driven. In fact, product innovations are introduced to satisfy an external user or market need, while process innovations are defined as new elements introduced into the firm's production or into the services it provides. The latter are essentially introduced by the firm with a view towards improving its efficiency.

2.5 Summary

In our literature review, there has been a surprising dearth of empirical studies that test hypotheses with respect to financial innovation in general and its effect on financial performance. Instead, the comparatively few empirical studies that have been done tend to focus on the characteristics of users/adopters of innovations – sometimes on a cross-sectional basis and other times in the context of the diffusion of the innovation. In surveying the literature in preparation for this study, it is evident that more empirical studies have appeared, but the field is still relatively sparse, and the studies still focus largely on the characteristics of users/adopters, reasons for innovation and challenges therewith. The studies that have been done linking innovation and performance have been done in US, Latin America or Europe.

Further, reviewed literature indicates that in the industrialized countries of North America and Western Europe has shown that financial innovation has acquired a bad connotation after the recent financial crisis. However, innovation as indicated in the

literature is more than that and comprises numerous new products, new processes and new organizational forms. Innovation can be an enormously positive force, even in the financial system and especially in Africa. However, in order to reap the benefits of more innovation, a different regulatory approach and corporate governance is needed than currently present in most African countries.

The chapter has also shown that the past three decades have been a period of substantial change in terms of bank services and production technologies. As this study indicates, although much has been learned about the characteristics of users and adopters of financial innovations and the welfare implications, how and why financial innovations are initially developed, little is known about the implications of the innovations on the innovator's financial performance. This remains an important area for further research.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used to carry out the study. The chapter considers in detail the methods that were used to collect primary or secondary data required in the study. In this chapter, the researcher discusses the research design and population size used. The researcher also discusses how collected data was analyzed giving details of any models or programmes that were used in analysis with reasons as to why these particular models or programmes were applied.

3.2 Research Design

The causal research design was used to carry out this study. According to Cooper and Schindler (2006), a causal study is designed to establish the influence of one variable(s) on another variable(s) which depicts causation. Causal research is typically structured with a clearly stated objective of discovering associations and causal relationships among different variables. This design is perceived to be suited to this study in that it involves collection, verification, and synthesis of evidence to establish facts that defend or refute a hypothesis. This design involved use of secondary sources of data. Secondary data was derived from sources such as official records, reports, archives, and financial statements. The sources were tested for both authenticity and validity through cross checking with reports from central banks' bank regulatory reports. .

The causal research design is unobtrusive and the act of research does not affect the results of the study. This is well suited for cross sectional analysis and in the study, it

involved comparing financial results of banks with their innovation parameters. The historical records can add important contextual background required to more fully understand and interpret the research problem. This design is further useful in that there is no possibility of researcher-subject interaction that could affect the findings. Historical sources can also be used over and over to study different research problems or to replicate a previous study (Cooper and Schindler, 2006).

3.3 Population and Sample of size

The population of study was all the 43 commercial banks in Kenya as at 30th June 2012. No sampling was done due to the small population size and aggregation of secondary data used in the study.

3.4 Data Collection

The study used secondary data obtained from reports published by the Central Bank of Kenya; which is also the regulator of the banking sector. Dependent variable, Consolidated Commercial banks' profit after tax and exceptional items was obtained from CBK's annual bank supervision reports. This was done by excluding PAT of non financial banking institutions from the banking sectors PAT figure.

The independent variables; automated clearing house throughput and RTGS turnovers were obtained from CBK's annual statistics presented under payments systems statistics, retail payments section. A study period of 4 years (2008 to 2011) was used.

3.5 Study Variables

The variables of the study were classified into independent and dependent variables. The independent variable was financial innovation in the banking sector particularly

innovations unique to commercial banks. The variable was measured by automated clearing house annual throughput and the annual value of RTGS transfers

The dependent variable was financial performance, measured by the annual consolidated profit after tax and exceptional items of the 43 commercial banks (Banking Sectors profit after tax & exceptional items less profit after tax of all Non Banking Financial Institutions).

3.6 Data Analysis

The relationship between the dependent variable and the independent variables are determined by the below presented regression model. Variables data was analysed using Statistical Package for Social Sciences (SPSS)

The Regression model was of the form below;

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where:

Y- Commercial Banks' consolidated Profit after Tax & exceptional items for $year_{1\ldots n}$

X_1 – Value of sector RTGS transfers for $year_{1\ldots n}$

X_2 – Value of sector automated clearing transactions for $year_{1\ldots n}$

ε = Error or random term

a, β_1, β_2 – constants

Significance of innovation variables as predictors of financial performance was tested using the t-test. The significance of the overall model in explaining performance

through the independent variables was measured through the f-test. The analyzed data was then presented using tables

.   36

A correlation analysis was also performed to find how the variables were related to each other in the model.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of data, findings from the study and discussion of the findings. Section 4.2 presents data analysis while section 4.3 presents findings from the study. Section 4.4 presents discussion of the findings where the findings are compared and contrasted with other results from previous studies.

4.2 Data Collection and Analysis

The study sought to collect and analysis consolidated data from the 43 commercial banks in Kenya. Secondary data obtained from reports published by the Central Bank of Kenya; which is also the regulator of the banking sector was used. Dependent variable, Consolidated Commercial banks' profit after tax and exceptional items was obtained from CBK's annual bank supervision reports. PAT from non financial banking institutions was excluded from the total banking sectors PAT to obtain PAT from commercial banks.

The independent variables; automated clearing house throughput and RTGS turnovers were obtained from CBK's annual statistics presented under retail payments. A study period of 4 years (2008 to 2011) was used.

4.2 Results

A regression analysis between the dependent variable and the independent variables was performed; independent variables being value of sector RTGS transfers for year and value of sector automated clearing transactions for year. The dependent variable

was banking sector's profit after tax & exceptional items for year. Results are as indicated in tables 4.1 to 4.4.

Results in table 4.1 indicate that the r-squared for the model was 0.987, which indicates that the independent variables can be used to explain about 98.7% of the variation in profits in the banking sector. This indicates that the regression model has a strong explanatory power as only about 1.3% of variation in profitability ion the banking sector is not explained by the model.

R	R Square	Adjusted R Square	Std. Error of the Estimate
.998	.996	.987	1928.801

Table 4.1: Regression Model Summary

Results in table 4.2 give the analysis of variances in the regression model. These results indicate that the model had an f-ratio of 112.997 which was significant at 6.6% level of significance. This result indicates that the overall regression model is statistically significant and is useful for prediction purposes at 10% significance level. This further indicates that the independent variables used (value of sector RTGS transfers for year and value of sector automated clearing transactions for year research) are statistically significant in predicting profitability of commercial banks.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	840759266.346	2	420379633.173	112.997	.066
Residual	3720271.654	1	3720271.654		
Total	844479538.000	3			

Table 4.2: Analysis of Variances in the Regression Model

Results in table 4.3 below present the test of the statistical significance of the independent variables in the model. This provides the estimates of independent variables, their standard error and the t-ratios. The table also provides the statistical significance of each independent variable in the regression model. The results indicate that the t-ratio for value of sector RTGS transfers for year was 3.703. This t-ratio is significant at 10% level of significance (0.068) which indicates that value of the banking sector's RTGS transfers for year are a significant predictor of profitability of commercial banks. The estimate of value of the banking sector's RTGS transfers for year is .001 which indicates that value of the banking sector's RTGS transfers is positively related to profitability in commercial banks.

The value of sector automated clearing transactions had a coefficient estimate of -.011 which indicates that it had a negative relationship with profitability. The t-ratio for value of sector automated clearing transactions was -10.336 which was significant at 10% level of significance. This indicates that value of sector automated clearing transactions is a significant predictor of profitability of commercial banks. This indicates that as value of sector automated clearing transactions decrease, profitability increases.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	56808.445	9502.845		5.978	.106
ACH	-.011	.001	-.812	-10.336	.061
RTGS	.001	.000	.291	3.703	.068

Table 4.3: Test of Significance of Independent Variables

A partial correlation analysis using Karl Pearson correlation coefficient was performed. A negative coefficient indicated a negative relationship between the variables correlated; in which case an increase in one variable would result into a decrease in the other variable and vice versa. A positive coefficient on the other hand indicates a positive relationship in the variables; meaning that changes in the variables move together. An increase in one variable would therefore result into an increase in the other variable and vice versa.PATEI was correlated with ACH throughput as well as RTGS annual turnover values.

Table 4.4 below indicates that profit after tax and exceptional items is positively correlated with RTGS, but negatively correlated to Automated clearing House turnover. The correlation between profit and automated clearing turnover (-0.967) is a strong negative correlation. This is significant at 5% significance level. The correlation between profit after tax and exceptional items and RTGS is also strong (0.725) indicating that there is a positive linear association between profit and RTGS. This association is statistically significant at 10% significance level. These findings indicate that the two independent variables have a strong linear association with profitability.

		PATEI	RTGS	ACH
PATEI	Pearson Correlation	1	.725	-.967
	Sig. (2-tailed)		.275	.033
	N	4	4	4
RTGS	Pearson Correlation	.725	1	-.534
	Sig. (2-tailed)	.275		.066
	N	4	4	4
ACH	Pearson Correlation	-.967	-.534	1
	Sig. (2-tailed)	.033	.066	
	N	4	4	4

Table 4.4 Correlation between Profit, Automated Clearing and RTGS

4.5 Discussion

Study results indicated that the independent variables (RTGS and ACH thoughput) explain and can therefore predict financial performance of commercial banks. These variables could explain 98.7% of the variation in profits in the banking sector (r-squared = 0.987). This indicates that the regression model had a strong explanatory power as only 1.3% of variation in profitability in the banking sector is not explained by the model.

This is consistent with a study by Noyer (2007) which argued that financial innovation in the banking industry has been spurred by research in products and services and new distribution channel systems such as internet and mobile banking as well as innovation in payment systems. This, according to Noyer (2007) has translated into more improved financial performance of the banks that make a conscious effort to innovate. Although this study looked at banks grouped as a sector, and not individually, improved of performance of banks individually would result into better sector performance by aggregation.

A study by Tidd and Hull (2003) also determined that the banking sector in emerging economies is characterized by rapid innovations in new financial instruments, systems and explosive growth in information technology which have fuelled financial performance.

The study results indicated that the t-ratio for RTGS throughput/to PATEI was 3.703, the ratio being significant at 10% level of significance which indicates that RTGS throughput is a significant predictor of financial performance of commercial banks. While the t-ratio of sector automated clearing transactions had a coefficient estimate of -.011 which indicates that it had a negative relationship with profitability. The t-

ratio for value of sector automated clearing transactions was -10.336 which was significant at 10% level of significance. This indicates that value of sector automated clearing transactions is a significant predictor of profitability of commercial banks. This implies that as the value of sector automated clearing transactions decrease, profitability increases.

Correlation analysis indicated a strong positive correlation, at 0.725, between PATEI and RTGS turnover. This positive linear correlation was statistically significant at 10% significance level. Correlation between PATEI and ACH throughput was found to be strongly negative at -0.967. A decline in the ACH throughput would be likely to result into an increase in PAT and vice versa as the changes in the two move in the opposite direction.

The two independent variables were found to be negatively correlated; meaning that an increase in the turnover of RTGS annually would result into a decline in the annual turnover recorded by the automated clearing house. This finding is evidence that as more effective payment systems are developed, bank customers' progressively adopt them in place of the traditional systems. RTGS present more benefits in funds transfers and payments while at the same time significantly reduce risks inherent in the ACH payment system. While the clearing period for cheques and electronic funds transfers (EFTs) has reduced to T+1 days with the full implementation of the Kenya Bankers' Cheque Truncation System (CTS) in January 2012; RTGS transfers are real time thereby providing better efficiency and security to bank customers.

While cheques were capped to a maximum of Kes 1 Million with the introduction of CTS, EFTs make up for this limitation thereby allowing transfers of more than Kes 1

Million through the ACH. With RTGS and ACH therefore acting as substitute payment and transfer system options, it would be expected that uptake of RTGS would result into a decline in usage of ACH.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the researcher presents the summary, conclusions and the recommendations made from the study findings. In section 5.2, summary of findings are presented. Section 5.3 presents conclusions made from the study findings while section 5.4 presents recommendations made after considering the study findings. Section 5.5 presents suggestions for any further studies that may be done in field of financial innovation in the banking sector.

5.2 Summary of Findings

The study sought to collect banking industry data of 43 commercial banks in Kenya. Data analysis was through multiple linear regression and correlation analysis. Correlation analysis was through Karl Pearson correlation coefficients.

Study results indicated that the independent variables (RTGS and ACH thoughput) explain and can therefore predict financial performance of commercial banks. These variables could explain 98.7% of the variation in profits in the banking sector (r-squared = 0.987). This indicates that the regression model had a strong explanatory power as only 1.3% of variation in profitability in the banking sector is not explained by the model.

The t-ratio for RTGS throughput/to PATEI was 3.703, the ratio being significant at 10% level of significance which indicates that RTGS throughput is a significant predictor of financial performance of commercial banks. While the t-ratio of sector automated clearing transactions had a coefficient estimate of -.011 which indicates

that it had a negative relationship with profitability. The t-ratio for value of sector automated clearing transactions was -10.336 which was significant at 10% level of significance. This indicates that value of sector automated clearing transactions is a significant predictor of profitability of commercial banks. This implies that as the value of sector automated clearing transactions decrease, profitability increases.

Correlation analysis indicated a strong positive correlation, at 0.725, between PATEI and RTGS turnover. This positive linear correlation was statistically significant at 10% significance level. Correlation between PATEI and ACH throughput was found to be strongly negative at -0.967. A decline in the ACH throughput would be likely to result into an increase in PAT and vice versa as the changes in the two move in the opposite direction. Correlation between RTGS and ACH throughput was found to be negative

5.3 Conclusion

From the study results, it is evident that financial innovation in payment systems result into improved financial performance of commercial banks and thereby to that of the banking sector as a whole. This is supported by the positive correlation between profit after tax and exceptional items and Real Time Gross Settlement transactions turnover.

Financial innovation presents more convenience, efficiency and security to commercial banks customers resulting to more demand (uptake) for the new innovations. Demand for traditional payment systems reduces as customers switch to the more effective payment systems; this as seen by the negative correlation between

Real Time Gross Settlement transactions turnover and Automated Clearing House Throughput and the negative correlation between profitability and ACH throughput.

5.4 Recommendations

From the study findings, the following recommendations are proposed. First, banks as well as the regulatory bodies should strive to innovate for better and cheaper ways of serving customers. With shorter transaction turnaround times, transactions volumes can be significantly increased and by extension commission charges there from.

Government through the financial sector regulatory authorities, more so CBK, should encourage banks to engage in financial innovation but at the same time closely regulating such developments to assure on the integrity of more so the payment systems.

Financial innovation is the engine of sustainable economic growth.Faster and more secure payment systems spurs development of businesses and economic growth in all other sectors in addition to facilitating financial deepening. This is key to the attainment of Kenya's Vision 2030's economic pillar objectives.

5.5 Suggestions for Further Research

As this study considered the relationship of only two financial innovation variables at a macro level, more research on the correlations between the performance of various financial innovations; such as products and channels would be needed.

It would also be of value to explore at a micro level whether bank characteristics such as size, capital base, top management and geographical coverage determine the banks innovation orientation.

Another suggested study would be to explore on the challenges that banks face development and implementation of innovative products and services and ways of addressing such challenges.

5.6 Limitation of the Study

Banking sectors' profit after tax and exceptional items figures were only available on an annual basis. Regression was therefore based on the annual figures even though ACH and RTGS values were available on monthly basis. Availability of the data on a quarterly or monthly basis would have provided more precision in the regression results. The CBK could consider publishing banking sector financial reports on a quarterly basis where feasible.

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APPENDICES

Appendix I: RTGS, ACH and PATEI Values and Volumes

a) RTGS- KEPSS monthly values and volumes

RTGS TRANSACTIONS		
Month, Year	Value- Kes Millions	Volume
Dec, 2011	1,562,080.00	117,916.00
Nov, 2011	1,816,270.00	112,923.00
Oct, 2011	2,004,110.00	113,658.00
Sep, 2011	1,729,950.00	118,798.00
Aug, 2011	2,007,040.00	110,498.00
Jul, 2011	2,151,280.00	103,338.00
Jun, 2011	2,617,340.00	107,063.00
May, 2011	1,867,910.00	103,112.00
Apr, 2011	1,727,570.00	88,168.00
Mar, 2011	1,801,550.00	103,986.00
Feb, 2011	1,288,840.00	84,448.00
Jan, 2011	1,319,870.00	77,625.00
Annual Value, yr 2011	21,893,810.00	1,241,533.00
Dec, 2010	1,400,960.00	92,592.00
Nov, 2010	1,430,130.00	85,968.00
Oct, 2010	1,375,620.00	76,415.00
Sep, 2010	1,256,470.00	82,770.00
Aug, 2010	1,280,470.00	70,771.00
Jul, 2010	1,425,810.00	75,289.00
Jun, 2010	1,500,990.00	79,760.00
May, 2010	1,587,240.00	72,588.00
Apr, 2010	1,436,310.00	69,634.00
Mar, 2010	1,694,230.00	77,058.00
Feb, 2010	1,458,480.00	65,010.00
Jan, 2010	1,254,020.00	56,862.00
Annual Value, yr 2010	17,100,730.00	904,717.00
Dec, 2009	1,454,000.00	66,916.00
Nov, 2009	1,429,960.00	56,900.00
Oct, 2009	1,480,730.00	55,440.00
Sep, 2009	1,198,240.00	24,552.00
Aug, 2009	1,127,100.00	23,001.00
Jul, 2009	1,184,970.00	25,650.00
Jun, 2009	1,031,560.00	21,977.00
May, 2009	1,064,250.00	24,024.00
Apr, 2009	107,235.00	22,485.00
Mar, 2009	1,234,920.00	23,752.00
Feb, 2009	1,236,480.00	20,710.00

Jan, 2009	1,375,950.00	25,330.00
Annual Value, yr 2009	13,925,395.00	390,737.00
Dec, 2008	1,293,360.00	24,131.00
Nov, 2008	1,225,150.00	22,718.00
Oct, 2008	1,343,930.00	23,635.00
Sep, 2008	1,367,430.00	23,494.00
Aug, 2008	1,327,200.00	20,593.00
Jul, 2008	1,863,960.00	24,599.00
Jun, 2008	2,600,810.00	22,387.00
May, 2008	1,895,020.00	19,730.00
Apr, 2008	1,219,920.00	24,684.00
Mar, 2008	890,747.00	20,920.00
Feb, 2008	985,324.00	23,278.00
Jan, 2008	1,256,390.00	23,773.00
Annual Value, yr 2008	17,269,241.00	273,942.00

Source: CBK rates and statistics annual reports

b) ACH total throughput values and volumes- cheques and EFTs

Automated Clearing House- Throughput		
Month, Year	Value- Kes Millions	Volume in Millions
Dec, 2011	210,000.00	2,296.00
Nov, 2011	214,000.00	2,502.00
Oct, 2011	199,000.00	2,135.00
Sep, 2011	217,000.00	2,371.00
Aug, 2011	207,000.00	2,294.00
Jul, 2011	196,000.00	2,270.00
Jun, 2011	195,000.00	2,313.00
May, 2011	210,000.00	2,425.00
Apr, 2011	172,000.00	2,004.00
Mar, 2011	212,000.00	2,528.00
Feb, 2011	184,000.00	2,296.00
Jan, 2011	179,000.00	2,262.00
TOTAL, 2011	2,395,000.00	27,696.00
Dec, 2010	206,000.00	2,710.00
Nov, 2010	195,000.00	2,614.00
Oct, 2010	184,000.00	2,183.00
Sep, 2010	193,000.00	2,650.00
Aug, 2010	176,000.00	2,356.00
Jul, 2010	179,000.00	2,318.00
Jun, 2010	159,000.00	2,179.00
May, 2010	174,000.00	2,400.00
Apr, 2010	171,000.00	2,280.00

Mar, 2010	194,000.00	2,781.00
Feb, 2010	162,000.00	2,318.00
Jan, 2010	152,000.00	2,005.00
TOTAL, 2010	2,145,000.00	28,794.00
Dec, 2009	187,000.00	2,704.00
Nov, 2009	165,000.00	2,329.00
Oct, 2009	166,000.00	2,363.00
Sep, 2009	413,000.00	2,224.00
Aug, 2009	375,000.00	2,099.00
Jul, 2009	397,000.00	2,357.00
Jun, 2009	414,000.00	2,244.00
May, 2009	371,000.00	2,126.00
Apr, 2009	413,000.00	2,182.00
Mar, 2009	409,000.00	2,601.00
Feb, 2009	351,000.00	2,111.00
Jan, 2009	357,000.00	2,022.00
TOTAL, 2009	4,018,000.00	27,362.00
Dec, 2008	428,000.00	2,295.00
Nov, 2008	349,000.00	2,092.00
Oct, 2008	406,000.00	2,190.00
Sep, 2008	404,000.00	2,258.00
Aug, 2008	348,000.00	1,887.00
Jul, 2008	416,000.00	2,399.00
Jun, 2008	419,000.00	2,369.00
May, 2008	392,000.00	2,138.00
Apr, 2008	427,000.00	1,979.00
Mar, 2008	323,000.00	1,818.00
Feb, 2008	338,000.00	1,922.00
Jan, 2008	375,000.00	1,920.00
TOTAL, 2008	4,625,000.00	25,267.00

Source: CBK rates and statistics annual reports

c) Banking Sectors Annual Profit after Tax and Exceptional Items (Excluding NBIs)

Banking Sectors' Profit After Tax & Exceptional Items (Excluding NBIs)	
Year	Kes (Millions)
2011	63,296.00
2010	57,209.00
2009	33,594.00
2008	29,697.00

Source: CBK bank supervision annual reports

Appendix II: List of Commercial Banks in Kenya

1. African Banking Corporation Ltd.
2. Chase Bank (K) Ltd
3. Commercial Bank of Africa Ltd
4. Consolidated Bank of Kenya Ltd
5. Co-operative Bank of Kenya Ltd
6. Credit Bank Ltd
7. Development Bank of Kenya Ltd
8. Diamond Trust Bank Kenya Ltd
9. Equatorial Commercial Bank Ltd
10. Equity Bank Ltd
11. Family Bank Limited
12. Fidelity Commercial Bank Ltd
13. Fina Bank Ltd
14. First community Bank Limited
15. Giro Commercial Bank Ltd
16. Guardian Bank Ltd
17. I & M Bank Ltd
18. Jamii Bora Bank Limited
19. Kenya Commercial Bank Ltd
20. K-Rep Bank Ltd
21. National Bank of Kenya Ltd
22. NIC Bank Ltd
23. Oriental Commercial Bank Ltd
24. Paramount Universal Bank Ltd
25. Prime Bank Ltd
26. Victoria Commercial Bank Ltd
27. Trans-National Bank Ltd
28. Imperial Bank Ltd
29. Bank of Africa Kenya Ltd
30. Bank of Baroda (K) Ltd
31. Bank of India
32. Barclays Bank of Kenya Ltd
33. CFC Stanbic Bank Ltd

34.	Charter House bank Ltd (Under Statutory Management)
35.	Citibank N.A Kenya
36.	Dubai Bank Kenya Ltd
37.	Ecobank Kenya Ltd
38.	Gulf African Bank Limited
39.	Habib Bank A.G Zurich
40.	Habib Bank Ltd
41.	Middle East Bank (K) Ltd
42.	Standard Chartered Bank Kenya Ltd
43.	UBA Kenya Bank Limited

Source: Central Bank of Kenya 2012.