EFFECT OF INVESTMENT IN FINANCIAL INNOVATIONS ON FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

BY

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MASTER OF BUSINESS ADMINISTRATION (CORPORATE MANAGEMENT)

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF BUSINESS ADMINISTRATION (CORPORATE MANAGEMENT) IN THE SCHOOL OF BUSINESS & PUBLIC MANAGEMENT AT KCA UNIVERSITY

NOVEMBER 2016

DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

Abraham Kiprono Kiptum **Reg. Number KCA/08/02423**

Sign: _____ Date: _____

I do hereby confirm that I have examined the Master's dissertation of

Abraham Kiprono Kiptum

And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed.

Sign: _____ Date: _____

Dr. Rotich Abraham

Dissertation Supervisor

ABSTRACT

The use of financial innovation in commercial banking in Kenya is on the rise in as a policy of mitigating the challenges posed by the dynamic banking environment. This study aims at establishing the contribution of this use of financial innovation on the financial performance of the commercial banks in Kenya. The dependent variable are institutional innovation, product innovation and marketing innovation. The dependent variable is financial performance (Return on Asset). The previous research work did not use all the independent variable but most on specific individual innovations. The study adopts a descriptive study where use of panel data was used in the data analysis of the secondary data collected from published financial records or from the finance departments of commercial banks in Kenya. The target population included the 41 commercial banks in Kenya. It adopted a census survey where 41 banks were used in the study and there was no sampling since the population size was small. Regression and correlation analysis was used to study the relationship between the dependent and the independent variables of the study. These were employed to analyze the data and find out whether there was any effect of financial innovations on financial performance of commercial banks. The study used descriptive statistics such as mean and standard deviation to describe the data with regard to the variables. The effect of each type of innovation on financial performance will be assessed using regression analysis. The findings would be used to make recommendations regarding the use of financial innovation as policies of ensuring competitiveness in the commercial banking sector in Kenya.

Keywords: Commercial Banks**,** Financial Innovation, Financial Performance,

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DEDICATION

This dissertation is dedicated to my wife Jane Kagoni, my lovely daughters Faith Cherotich and Winnie Chepchirchir may God bless them

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ABBREVIATIONS AND ACRONYMS

ANOVA	-	Analysis of Variance
ATM	-	Automated Teller Machines
CBK	-	Central Bank of Kenya
CRB	-	Credit Reference Bureaus
FDI	-	Foreign Direct Investment
GCI	-	Global Competitiveness Index
GCR	-	Global Competitiveness Report
ICT	-	Information Communication and Technology
KPMG	-	Klynveld Peat Marwick Goerdeler
MFB	-	Microfinance Banks
MRP	-	Money Remittance Providers
R&D	-	Research and Development
ROA	-	Return on Assets
SACCO	-	Savings and Credit Cooperatives
WEF	-	World Economic Forum

OPERATIONAL DEFINITION OF TERMS

Commercial Bank A commercial bank is an intermediary financial institution in Kenya that makes profit through raising funds mostly through deposits (checkable,savings and time deposits) and using the funds to offer loans (mortgages, consumer andcommercial loans) and investing in debt securities (Heffernan, 2005).

Institutional Innovation The novel, useful and legitimate change that disruptsthe cognitive, normative, or regulative mainstays of a commercial bank in Kenya (Raffaelli & Glynn, 2014)

Marketing Innovation New financial marketing programs and technologies that enable commercial banks in Kenya to reach consumers more effectively; to use pricing strategies that were previously not feasible; and to use new trading formats and techniques(Chen Y. , 2003).

Product Innovation Developmentof new financial products, changes in design of established financial products, or use of new materials or components in of established products by commercial banks in Kenya (Weiermair, 2004).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

To maintain their competitiveness despite the changes in the banking environment, commercial banks develop new products or make institutional changes or market their products innovatively (Lawrence, 2010). The changes can lead to introducing a new product, popularizing a product, using new technologies, rising of new institutions or reorganizing current ones with the aim of facilitating access to information, trading and means of payment. With these changes, it is expected that the performance of the commercial bank undergoes change too (Solans, 2003). Performance measurement and reporting is now widespread across the banking sectors in many industrialized and industrializing countries (Williams, 2003). The measurement of the performance is done to provide investors in the banking sector with the required information with regard to how their investments are generating value for them. Further according to Cicea and Hincu (2009), commercial banks represent the core of the credit for the national economy. The credit, in turn, serves as the engine that drives financial flows that determine growth and economic development. The efficiency in the activities of commercial banks has direct implications on the entire economy.

The management of every commercial bank has the duty of ensuring that every policy they undertake adds value to investors and to the country at large. Assessing investment performance within changing banking environment will ensure the banks achieve investment objectives and determine the general direction of the behavior of investment activity. For instance, the role of banking in financial intermediation has profoundly transformed owing to changes in the global and local financial systems. Some of the changes include the need for

improved financial inclusion that has led to financial innovations to promote the financial inclusion. Other drivers of financial innovation have been the globalization of financial systems, deregulation, and great advances in technologies. However, it remains to be answered whether these changes improve the financial performance of the commercial banks (Korir, Sang, Shisia, & Mutung'u, 2015).

1.1.1 Commercial Banks

The banking sector in Kenya comprises of the Central Bank of Kenya, as the regulatory authority, 43 commercial Banks, 1 Mortgage Finance Company, 8 representative offices of foreign banks , 9 Microfinance Banks (MFBs), 2 Credit Reference Bureaus CRBs 13 Money Remittance Providers (MRPs) and 87 Foreign Exchange (Forex) Bureaus. Out of the 44banking institutions, 30 are locally owned commercial while 14 are foreign owned. Of the 14 foreign owned banks 10 are locally incorporated subsidiaries of foreign banks and 4 are branches of foreign incorporated banks. 11 of the 44 banking institutions are listed on the Nairobi securities Exchange (CBK, 2014). The Kenyan financial sector has undergone tremendous changes in the last two decades (1990-2010). Misati, Njoroge, Kamau and Ouma (2010) for instance, document that financial products have increased, activities and organizational forms have also improved and the overall efficiency of the financial system has increased (CBK 2014). Commercial banks branch network has grown from 1,342 in2013 to 1,443 branches by end of December 2014, which translated to an increase of 101 branches. The increase in the use of technology by banks has beendriven mainly by stiff competition leading them to adopt cost effective channels. The Kenyan banking sector comprises 43 commercial banks. The sector is relatively well developed and dynamic, while access to credit has been boosted over the past decade by the advent of mobile and agency banking. A number of Kenyan banks have also expanded into neighboring countries. Prudential guidelines introduced in 2012 have helped to improve banks' risk

management practices. The sector has continued to record strong growth during 2013, seeing as the deposit base expanded by 12.5%, while gross loans grew by 17.65% year on year in December 2013. Also, the demand for credit picked up significantly following the peaceful conclusion of elections in March 2013. Credit demand was further boosted by lower interest rates and an upbeat macroeconomic outlook. Kenya's banking sector has a favorable outlook for 2014.This view is supported by solid macroeconomic fundamentals, continued expansion of Kenyan banks into the region, further expansion of the branch network and agency banking in the domestic market, and higher demand for banking services due to the government's devolution process(KPMG,2013)

World Economic Forum (WEF) an independent international organization committed to improving the state of the world by engaging business, political, academic and other leaders of society to shape global, regional and industry agendas. The World Economic Forum's Centre for Global Competitiveness and Performance through its Global Competitiveness Report (GCR) and report series, aims to mirror the business operating environment and competitiveness of over 140 economies worldwide. The report series identify advantages as well as impediments to national growth thereby offering a unique benchmarking tool to the public and private sectors as well as academia and civil society (World Economic Forum, 2015). The banking industry has been earmarked as a key pillar to the achievement of vision 2030 (a long-term strategy to achieve sustainable growth by year 2030) through increased savings, encouragement of Foreign Direct Investment (FDI), safeguarding the economy from external shocks as well as propelling Kenya to become a leading financial Centre in Eastern and Southern Africa. Within the second Medium Term Plan (2013-2017) under vision 2030, some of the target areas include development of a safe and reliable payments system that will ensure smooth transfer and settlement of funds

between customers and banks as well as between banks. Towards this end, the use of mobile phone networks, internet, payment cards, operational resilience and security will be pursued in order to increase trust, integrity and confidence in the ICT based payment systems (Government of Kenya, 2015).

1.1.2 Concept of Financial Innovation

Financial Innovation entails commercial banks developing new products or new production methods or processes to improve how they perform their operations (Lawrence, 2010). Innovations in the finance sector indicates the arrival of a new or better product or a process that cuts the cost of producing existing services (Nofie, 2011). Innovations arise due to changes in the financial landscape due to fundamental changes including regarding deregulation, increased competition, and higher cost of developing new products, the rapid pace of technological innovation, more demanding customers and consolidation of corporations (Akamavi, 2005). In the financial services industry, innovation is the creation and popularization of new financial instruments, new technologies, new institutions and markets to facilitate access to financial information, trading and means of payment (Solans,2003). According to Lerner (2002), innovations are critical for firms in the financial services industry just as they are for firms in the non-financial sectors. They provide a mechanism of raising more capital at a lower cost than they could without the innovation. Financial innovations include institutional innovation, product/process innovation and marketing innovation. The use of Information Communication and Technology (ICT), for instance, as done by use of Automated Teller Machines (ATMs), mobile phone banking, online banking, and Agency banking has completely changed how banking is done. (Ahmad, 2006).

A study by Glynn (2013) observed that despite their durability, institutions get transformed over time to suit the needs and circumstances of the times with varying degrees of disruption. Financial institutions have continuously innovated to serve new markets or underserved populations with new products and structures that include micro-finance or other hybrid organizational forms. Institutional innovation can occur in existing institutions, as they adapt to address new opportunities, changed environments, or new cultural sensibilities (Battilana & Dorado, 2010). According to Tiwari (2005) product innovation refers to the introduction of a new product or a significant qualitative change in an already existing product. A product innovation can be a tangible manufactured good, a service or a combination of the two. Recent development of personal computers and mobile phones are product innovations that have drastically changed the way people live, work and interact with financial services providers. The various software that work with the computers and phones in providing financial services provide good examples of intangible products. A marketing innovation refers to the implementation of a new marketing method. The new marketing method should involve significant changes in the product design or packaging, product placement, product promotion or pricing. The main purpose of marketing innovations is to address customer needs in a better way, opening up new markets, or newly positioning a firm's product on the market in order to increasing the firm's sales. Marketing innovation provides a mechanism of mitigating risk in organizations (Scott, 2008).

1.1.3 Concept of Financial Performance

Performance of a firm is a controversial term consisting of four main dimensions. Customer-focused performance is about satisfying the customer using products or service. Financial and market performance focuses on revenues, profits, market position, cash-to-cash cycle time and earnings per share. Human resource performance is about employee satisfaction while

organizational performance is about the time to market, level of innovation, and production and supply chain flexibility (Alam, Raza, & Akram, 2011). All the different methods of establishing performance use organizational goals and objectives as the basis of measurement and judgment. The performance indicators can be measured in financial or nonfinancial terms. Most firms prefer financial indicators for measuring their performance. Some of the commonly used financial indicators used to measure firm performance include return on assets (ROA), net profit after tax and return on investment (ROI). Other commonly used measures include profitability, productivity, growth, stakeholder satisfaction, market share and competitive position (Bagorogoza & Waal, 2010).

1.2 Statement of the Problem

The liberalized financial market in Kenya has led to innovation in the Kenyan banking industry. To maintain profitability, banks have come up with various types of innovations aimed at avoiding the negative consequences of liberalization. However, the banking sector is still unstable with some banks being put under receivership. This raises the question of whether innovation in the financial sector is improving the performance of the financial sector in Kenya. The banking sector has experienced high performance volatility in financial performance (Central Bank of Kenya, 2014).Indeed the profitability of Kenya's banking industry in the recent past has been a cause of concern to the stakeholders. The interest based income of commercial banks has been volatile due to the volatility in the non-performing loans. And changes in legislation that has liberalized the finance sector has seen the profitability of the commercial banks vary (Central Bank of Kenya 2011). To respond to the changes in the financial environment, Commercial banks in Kenya have increased their use of financial innovation. It still, however, remains unclear how the increased investment on innovation is affecting the financial performance. The relationship between the growing investment on innovation in

banking and its contribution towards a bank's financial performance in Kenya still needs to be assessed. There is need to establish whether innovations have contributed to the financial performance of commercial banks in Kenya or are making the financial performance worse. Further, there is need to ascertain which types of innovations have the strongest contribution to the financial performance of the commercial banks to provide guidance to policy regarding financial innovation in banking (Mabrouk and Mamoghli, 2010).

An analysis of various studies in Kenya indicate no known study has been able to explain the contribution of the types of innovation to financial performance. The study by Wachira (2013), for instance, showed technological innovation was important to the financial performance of commercial banks, but did not show the exact relationship with regard to the other types of innovation. The study by Kihumba (2008) was limited to indicating that financial innovation was a determinant of a commercial bank's performance. It did not show how each type of innovation contributes to financial performance of a commercial bank. This study will, therefore, seek to fill this knowledge gap by studying the effect of institutional innovation, product innovation and marketing innovations on financial performance of commercial banks in Kenya.

1.3 Objectives

This section outlines the objectives which these study was to addresses.

1.1.1 General Objective

The main objective of this study was to establish the effect of bank investment on innovations on financial performance of commercial banks in Kenya.

1.1.2 Specific Objectives

These study was guided by the following specific objectives;

i. To determine the effect of expenditure on institutional innovation on the financial performance of commercial banks in Kenya.

ii. To determine the effect of expenditure on product innovation on the financial performance of commercial banks in Kenya.

iii. To determine how expenditure on marketing innovation affects the financial performance of commercial banks in Kenya.

1.4 Research Hypotheses

The study is guided by the following null hypotheses;

H_{o1} : *Expenditure on institutional innovation in banking has no effect on the financial performance of commercial banks in Kenya.*

H_{o2}: *Expenditure on product innovations have no effect on the financial performance of commercial banks in Kenya*

H_{o3}: *Expenditure on marketing innovation does not affect the financial performance of commercial banks in Kenya.*

1.5 Significance of the Study

This research would be important to the following people in the given ways:

Researchers in the field of commercial banking would find this research useful in explaining the effect of financial innovation on performance in Kenya's commercial banking sector. The research would shed light on whether or not the innovations invested in by commercial banks in response to the dynamic banking environment improves their financial performance. Further, the research would establish how the various financial innovations in the banking industry in Kenya is helping to improve financial performance. This would provide evidence that can be used by

future researchers who would find the research relevant to future scholarly dialogue on financial innovation in commercial banking. The management of commercial banks would find this research useful because it is addressing a key matter affecting the banking sector in Kenya. The performance of commercial banks is of interest to the management of commercial banks have come up with various innovations to respond to the changing commercial banking environment in Kenya and globally. This research serves the purpose of assessing how the innovations are contributing to the financial performance of the commercial banks. The findings will, therefore, provide objective assessment regarding the success of their use of financial innovation. The Central Bank of Kenya is tasked to tailor policies that contribute to financial health in the Kenyan economy. While it directs activity in the commercial banking sector, it lays down rules on how innovation can contribute to the financial performance of commercial banks. A well-researched report regarding the effect of innovation commercial banks would go a long way in providing objective information that can be used by the central bank in providing direction regarding the use of innovation as a driver of financial performance of commercial banks.

1.6 Scope of the Study

The study will cover41 commercial Banks licensed by the Central Bank of Kenya. The commercial banks that are currently in business and were operational by close of business as at 31stDecember 2015 are eligible for this study. The commercial banks form the units of analysis. The study is limited to establishing the relationship between financial innovation and financial performance of the 41 commercial banks. The financial innovations focused on are product innovation, institutional innovation and technological innovation. The study period is the ten years starting January 2006 to December 2015.

1.7 Limitations and Delimitations

The study is not will not be able to use data from all the time the banks have been operational in Kenya. It will instead focus on the period between 2006 and 2015. This may not be representative for the time before or after the study period. However, the use of historical data enables the study of the variables as they occurred in their natural environment thus providing insight into the relationships between the study variables. Due to time and resource constraints the study would only review innovations in the banking industry and therefore will not include other financial sector players such as the stock exchange, insurance, micro finance institutions, Savings and Credit Cooperatives (SACCO's) and pension funds. However this provides an opportunity for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature review regarding this study. Section 2.2 reviews the theories. Section 2.3 reviews the empirical literature while Section 2.4 identifies the research gaps. Section 2.5 discusses the conceptual framework.

2.2 Review of Theories

This section reviews the theories guiding this study. The theories are: the circumvention theory, the constraint-induced theory, regulation innovation theory and the location theory.

2.2.1 Circumvention Innovation Theory

The circumvention innovation theory was suggested by Kane (1981). The theory postulated that the many forms of government regulations and controls, have the same property as implicit taxation. These rules embarrass the profitable activities engaged in by companies and frustrate the ability to earn profit. Market innovation and regulation innovation are continuously fighting each other independent economic force and political forces prevailing. The financial industry has stricter rules because it is special. Financial institutions have to deal with regulation in order to reduce the potential reduction in profit and the failure Therefore, financial innovation is mostly induced by the purpose of earning profit and circumventing government regulations. Kane's (1981) theory is different from what happens in the real finance markets. The regulation innovation assumed in the model was the innovation towards the direction of reinforcing regulation. On the contrary, regulation innovation in reality is always geared towards the direction of liberalizing financial markets. The relevance of this theory to this study is that it is

considered the origin of innovation in the market and explained the process of regulation innovation and their dynamic relations.

2.2.2 Constraint-Induced Financial Innovation Theory

This theory was advanced by Silber (1983) who was an American economist. This theory points out that the purpose of financial innovation in financial institutions is profit maximization. However, there are some internal and external restrictions such as policy and organizational management and leadership style that limit the process of pursuing profit maximization. According to Silber (1983), these restrictions and limitations guarantee the stability of management and reduce the efficiency of financial institutions. Financial institutions, thus, strive at warding them off. The constraint-induced innovation theory discussed the financial innovation from the microeconomic perspective. It emphasizes innovation in adversity excessively. However, it still indicates that innovation is aimed at profit through fighting of adverse conditions facing the financial institutions. This theory suggests why commercial banks come up with new ways of generating income within the changing landscape. The theory suggests that there are constraints inside and outside the organization an innovations provide the mechanism of playing in the market with the aim of improving financial performance. As suggested by the theory, financial innovation positively contributes to the financial performance of a commercial bank.

2.2.3 Regulation Innovation Theory

The Regulation Innovation Theory is a theory that was put forth by Scylla (1982). The theory explains financial innovation from the economy development perspective. The theory suggests that financial innovation closely connects with social regulation in a country. Regulation transformation has mutual influence and has mutual causality with economic regulation. Scylla

(1982) posited that it is difficult to have financial innovation in planned economies with strict controls and in the pure free-market economy. As a result, it is change in the financial regulation that enables financial innovation. Innovative activities can only appear in government controlled economies. As government's intervention hinder finance activities, there arise many kinds of financial innovation 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". This theory expanded the scope of financial innovation and highlighted government activity as the motivation of financial innovation. The theory only regards regulation innovation as just one aspect of financial innovation, especially with regards to the rules and regulations used to control financial activity as financial innovation. The financial control is the obstructive force that drives financial innovation. The rules and regulations which are regarded as the symbol of financial control should be the pointers of the direction of financial reform and innovation (Scylla, 1982).

2.2.4 Location Innovation Theory

The location theory as put forth by Desai & Low (1987) posits that financial innovation is the method that ensure the integrity of financial market. The Location Innovation Theory was an advancement of the 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 intermediary model in which new securities secured by old securities are created. While decomposing old securities and opening new market, innovators play a significant and influential economical role. For instance, investors can obtain consumption at lower cost; investors can realize a better share of risks (Chen Z, 1993). The model suggests that even when

introducing the surplus securities which are yet to be distributed, innovators can still play the economic roles. In other words, although these innovations have not changed the scope of acquirable financial tools, investor's trade at lower expected costs. The main focus is on security designing in incomplete financial markets. This theory also explains the motivation of financial innovation and its contribution to the financial performance of financial institutions.

2.3 Review of Empirical Literature

This section presents the review of the empirical literature review of on the effect of financial innovations on financial performance of commercial banks. The review is guided by the three independent variables.

2.3.1 Financial Innovations and Financial Performance

Theories such as Circumvention Innovation Theory by Kane (1981), the Constraint-Induced Financial Innovation Theory by Silber (1983), Regulation Innovation Theory by Scylla (1982) and the Location Innovation Theory by Desai & Low (1987) suggest different methods regarding manifestation of innovation. However, all suggest that innovation inproves financial performance of any organization that uses the innovation effectively. The study by Korir, Sang, Shisia, & Mutung'u(2015) showed a strong relationship between innovation and performance of commercial banks. The study concluded that financial innovations positively affect financial performance. Though the study by Johnson & Kwak (2012) showed a close relationship between financial innovation and financial performance of organizations. However, in the innovation magnifies negative impact on financial performance the way it magnifies positive effect. This study concludes, basing on the empirical evidence above, that financial innovation affects financial performance but the effect can either be positive or negative.

2.3.2. Effect of Institutional innovation on Financial Performance

A study by Glynn (2013) observed that despite their durability, institutions undergo transformation over time and circumstances, to varying degrees and with varying degrees of disruption. Financial institutions have continuously innovated to serve new markets or underserved populations with new products and structures that include micro-finance or other hybrid organizational forms. Institutional innovation can occur in existing institutions, as they adapt to address new opportunities, changed environments, or new cultural sensibilities with the aim of maintaining or improving their financial performance (Battilana & Dorado, 2010). A study conducted by Mosongo, Gichana, Ithai & Nguta (2013) to establish whether there was a relationship between financial innovation and financial performance in the 41 registered SACCOs in Nairobi County. The study was descriptive in nature. The T-test, F-test and ANOVA were used to examine whether there was a significant relationship between financial innovation and financial performance. The study concluded that SACCOs adopted various types' financial innovation that lead to improved financial performance. Institutional innovation had greatest impact on financial performance. The study further concluded that there was a positive relationship between financial innovation and financial performance.

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. Basing on the studies above, the researcher finds that there is a positive relationship between institutional innovation and financial performance of commercial banks. This study also hypothesizes that institutional innovation positively affects financial performance of commercial banks in Kenya.

2.3.3. Effect of Product Innovation on Financial Performance

According to Tiwari (2005) product innovation refers to the introduction of a new product or a significant qualitative change in an already existing product. A product innovation can be a tangible manufactured good, a service or a combination of the two. Recent development of personal computers and mobile phones are product innovations that have drastically changed the way people live, work and interact with financial services providers. The various software that work with the computers and phones in providing financial services provide good examples of intangible products. A study conducted by Misra (2011) aimed at establishing the relationship between product innovation and financial performance. In the study, product innovation was operationalized by R&D while financial performance was operationalized by market risk. The study was conducted in 333 Indian firms using cross-sectional data from 2005 to 2009. In the study, it was established that there was an inverse relationship between a firm's R&D intensity and market risk. After controlling for variables such as growth rate in sales; dividend pay-out ratio; asset size; age of the firm; leverage; liquidity; and sales variability which also significantly influence market risk, an increase in firm R&D intensity lowers the market risk. This indicated product innovation improved performance. In another study by Gitau (2009) the aim was to assess the effect of mobile banking products on financial performance of commercial banks in Kenya. The study applied descriptive research design. The target population included the 42 commercial banks operating in Kenya as at December 2014.The key data collection instruments

of the required primary data were questionnaires. The analysis of the quantitative data was limited to descriptive statistics while qualitative data was presented through content analysis. The findings revealed that many mobile banking products are being offered by banks such as Fund Transfer between Accounts/ E-funds transfer, Bill Payment, order for cheque books and bank statements and these improved the financial performance of the banks that used the mobile banking products.

The study by Ngango, Mbabazize, & Shukla (2015) the purpose was to examine the contribution of E-banking towards banking on performance of banking Institutions in Rwanda. The study used descriptive research design applying survey methodology. Both primary and secondary qualitative and quantitative data were used in the research. The established that Electronic banking systems likeATM, Pay direct, electronic check conversion, mobile telephone banking and E transact has agreat impact on bank performance because they increase profitability, reduce bank cost of operations, and increase bank asset and bank efficiency. The study also established a significant relationship between E-banking and Performance of the bank of Kigali in Rwanda. The study conducted by Rayhan, Sohel, Islam, and Mahjabin (2012) whose objective was to establish the effect of mobile banking products on the performance of commercial banks in Bangladesh. The study was descriptive in nature and utilized survey methodologies. The study concluded that, mobile phone banking extends low cost virtual bank accounts to a large number of currently un-banked individuals. Mobile phones enhance the ability of electronic banking solutions to offer customers an enhanced range of services at a low cost. Such and many other benefits lead to improved profitability. The study by Ram,Kagan and Lingam (2008) examined the impact of online banking on the financial performance of community banks. The research was a correlation study. The relationship between on-line

banking was assessed by regressing profit efficiency index against a number of correlates including online banking intensity measure. Their results indicated that the increasing use of internet was an additional channel of marketing banking services products and had significantly improved the financial performance of community banks. The cited studies show that product innovation improves the financial performance of commercial banks. This study equally lays the hypothesis that product innovation improves the financial performance of commercial banks in Kenya.

2.3.4. Effect of Marketing Innovation on Financial Performance

A marketing innovation refers to the implementation of a new marketing method. The new marketing method should involve significant changes in the product design or packaging, product placement, product promotion or pricing. The main purpose of marketing innovations is to address customer needs in a better way, opening up new markets, or newly positioning a firm's product on the market in order to increasing the firm's sales. Marketing innovation provides a mechanism of mitigating risk in organizations (Scott, 2008). Sorescu & Spanjol (2008) conducted a study to determine the relationship between financial innovation and firm value. The study was conducted on using data on more than 20,000 new products from consumer packaged goods industries in the USA. Innovation was operationalized by newly consumer packaged goods. The study established that breakthrough marketing innovation was associated with increases in profits and economic rents.

The study by Nadia, Anthony and Scholnick (2003) was done to establish the relationship between Information Technology expenditures and bank's financial performance. The assumption was that the market share of a commercial bank is conditional upon the extent of the bank's IT network. The researchers expected that if the network effect is too low, IT expenditures

are likely to reduce payroll expenses, increase market share, and increase revenue and profit. However, evidence from the research suggested that the network effect was relatively high in the US banking industry, implying that although the commercial banks used IT to improve competitive advantage, the net effect was not as positive as expected. In fact the study found that the innovation in information-technology-based marketing could reduce the income streams of banks (Nadia, Anthony, & Scholnick, 2003).

In another study by Iftekhar, Schmiedel &Song (2009) sought to establish the effect of country level retail payment services network on the financial performance of commercial banks in 27 European Union countries. The evidence from analysis of data from the 27 markets confirmed that banks perform better in countries with more developed retail payment services network as measured by accounting ratios and profit and cost efficiency scores. The study in EU banks provided a very good testing ground for the link between retail payments network and bank performance because while the network was comprehensive in some countries, it was still fragmented in others. The relationship between the retail payment networks was stronger in countries with more retail payment transaction equipment, like ATMs and POS terminals. A higher usage of electronic retail payment instruments seems to stimulate banking business. The cited studies have shown mixed results regarding the relationship between marketing innovation and financial performance. While some show a positive relationship, one shows negative effect. This study leaves the relationship open. It is not possible to expressly say whether marketing innovation will improve or worsen financial performance of commercial banks in Kenya.

2.4 Research Gaps

From the literature review it is evident that there is close connection between banking financial innovation and financial performance. However, the relationship can be positive or negative.

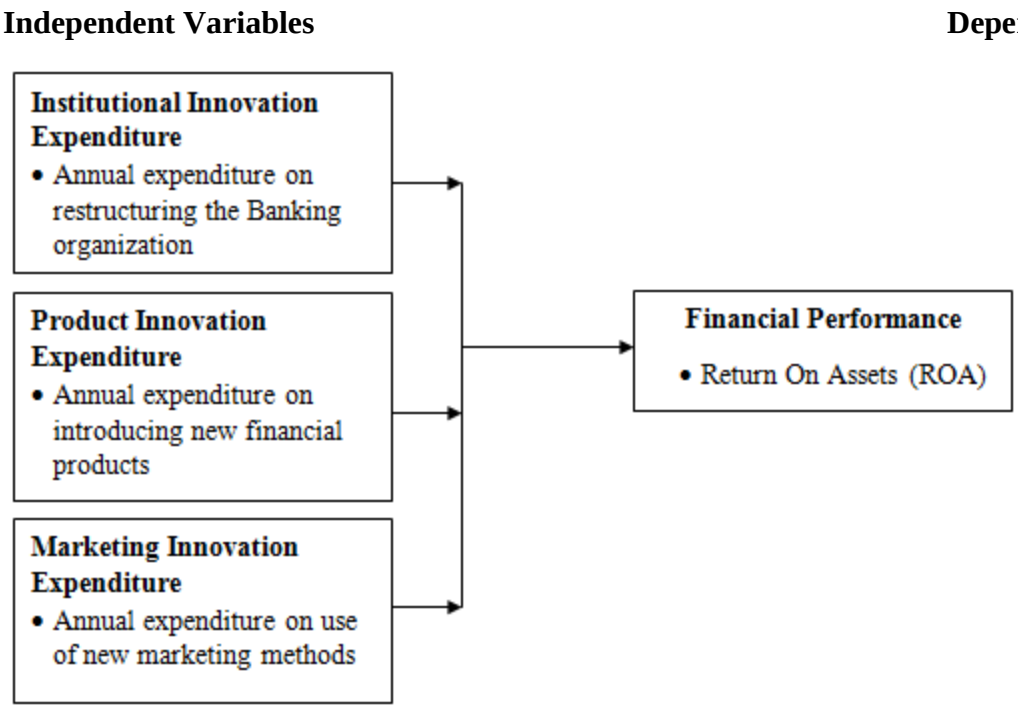
This leads to the rise of the question of how financial innovation affects the performance of commercial banks in Kenya since the findings in the empirical review may not be expressly applicable to commercial banks in Kenya. The review has not shown how institutional innovation affects financial performance of commercial banks in Kenya, it has not shown how product innovation affects financial performance of commercial banks in Kenya and it has not shown how marketing innovation affects financial performance of commercial banks in Kenya. These are the gaps this study would address.

2.5 Conceptual Framework

Figure one below shows the conceptual framework of this research. The dependent variable is financial performance which is measured by Return on Assets (ROA). The independent variable is financial innovation which is narrowed to institutional, product and marketing innovation. Institutional innovation will be measured by annual expenditure on restructuring banking organizations due to changes in the banking environment. Product innovation will be measured by the expenditure on coming up with new financial products. Marketing innovation will be measured by expenditure on new marketing strategies used by banks in response to changes in the banking environment (Gama & Salah, 2011).

FIGURE 1

Conceptual Framework



Source: Author (2016)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter is useful in the presentation of the research methodology adopted in this study. It has described the research design, population, detailed the sampling procedure, studies the collection, the instruments, test of reliability and validity of the instrument and explains the data analysis process

3.2 Research Design

The study adopted a descriptive study design and sought to examine the effect of investment in financial innovations on financial performance of commercial banks in Kenya. To achieve this purpose the study undertook a quantitative approach. A quantitative approach was deemed appropriate in this study since the data that was used was quantitative. Data used related to Commercial Banks licensed by the central Banks and were in Operation as at the close of end of the financial year 31st December 2015 covering ten years period (2006 to 2015). The purpose of the research design was to explain the effects of financial innovations on Commercial Banks performances. The study adopts a panel data design and obtained annual data from 41 commercial Banks for the period 2006 to 2015. There were 10 time series and 41 cross sectional. A panel research design was defined as the study that collects information from the same unit over time. The main advantage of this design was that since it gives room for in-depth analysis, the researcher is able to examine dynamic relationship among variables According to Simon (2011) in a correlation research design, the purpose of the researcher is investigating one or more characteristics of a specified group in order to discover the extent to which the characteristics co-vary.

A descriptive correlation study examines variables in their natural environments and without researcher-imposed treatments. A correlation study displays the relationships among variables using techniques such as cross-tabulation, correlations and regression. Correlation studies are also ex post facto studies indicating they are conducted after the phenomenon of interest has occurred naturally. The main purpose of a correlation study is the determination of relationships between variables and establishing a regression equation that could be used to make predictions to the whole population. This research is indeed a descriptive correlational study for the follwing reasons. First, the event of systemic risk will be studied in the natural environment of the commercial banks in kenya and the researcheer does not have a hand in the control of the ocurrence of the systemic risk. Secondly, the period for the study and the data to be used are historical. The study will use data from financial records of commercial banks for the ten years in the period 2006 to 2015. Thirdly, the study will seek to establish the relationship between institutional innovation, product innovation, marketing innovation and process innovation and systemic risk in commercial banks.

3.3 Target Population

According to Mugenda & Mugenda (2003), target population entails members of real or hypothetical set of people, objects, or events the researcher wishes to generalize the results of the research. The population of interest was composed of all the forty four Commercial Therefore, data collected and used in this study pertained to forty one Banks hence the study would be conducted on 41 headquarters of commercial banks in Kenya and all the 41 commercial banks who have their headquarters in Nairobi and operate in Kenya. From each bank the Finance manager will provide the required information where not publicly available and therefore the Finance managers of all the 41 commercial banks would form the population of this research.The

study would be a census since all banks are involved in financial innovation and the size of the population forms a manageable sample.

3.4 Research Variables

This research have four variables. The dependent variable is financial performance(Y). This variable is defined according to Trivedi (2010) who defined financial performance in terms of the return on Assets (ROA). The first independent variable is institutional innovation(X_1). This variable will be measured by a bank's expenditure on institutional innovation. This refers to the total annual expenditure on restructuring and investment banking expressed as a ratio of total expenses of the bank. The second independent variable is product innovation(X_2). This variable will be measured by a bank's percentage investment on product innovation. This would be operationalized by the percentage annual expenditure of a commercial bank on new financial products in a year. The third independent variable is marketing innovation(X_3). This will be captured by the percentage of annual expenditure of a commercial bank on new marketing methods.

3.5 Data Collection

The study used secondary data from the annual financial statements of the Commercial Banks for the last ten years. This data allowed for the calculation measures relevant to this study. The data constituted a mixed of cross-sectional and time series data and was therefore treated as panel data. The advantages of using the panel data over both cross sectional and time series data include: (a) since it relates to firms over time, there is the likelihood of the existence of heterogeneity in the units and therefore panel data takes this into account well by allowing for the subject specific variables. (b) by combing time series for the cross-sectional observations, this data becomes useful by giving more informative data, as well as more variability, leading to

less collinearity among variables and more degrees of freedom and hence more efficiency. (c) This makes the data better suited to enable the study the dynamics that involve change. The data would be collected by use of the data collection schedule in Appendix II.

3.6 Data Analysis

The data analysis will comprise the data preparations, data analysis and reporting. The excel and STATA software packages were used to explore and analyze the data. Data was first analyzed using panel regression methods due to the fact neither cross sectional data analysis nor time series data analysis would alone give the best results because of the combined variations of firms and time. Initially the data will be analyzed using the pooled ordinary leased squares (OLS) regression model. The panel regression model was used in analysis of the data could be either the fixed effects methodology or the random effects. The Fixed effect model assumes that individual groups / time had different intercept in the regression equations, while random effects model hypothesizes that individual groups / time have different disturbances. The random effect model separates the differences across components (panels) and individual are random and uncorrelated with the independent variables. The error term captures the random effects due to the panels and random errors. The random effects are treated as unique errors, for each panel, that had a normal distribution with zero means and variances.

To resolve the dilemma of choice between the random effect model or fixed effect model, the Hausman (1978) specification test were carried out. If the null hypothesis is rejected we used the fixed effect model; otherwise we will go for the random effects models. A panel data would be subjected to the use of descriptive statistics such as the mean, standard deviation maximum and minimum to describe the data used in the analysis. Data was subjected first to diagnostic tests to determine the presence of autocorrelation, heteroscedasticity, multicollinearity,

stationarity, model specificity. Autocorrelation was tested by using the Durbin-Watson test. Heteroscedasticity is a condition where the variance of the error terms differ across observations. The Breusch–Pagan test was used to test for heteroscedasticity. Multicollinearity was tested using the Variance Inflation Factor (VIF). A panel data regression model was used to examine the relationship between the resulting independent variable i.e. Expenditure on Institutional Innovations, Product Innovations and Marketing Innovations have on the dependent variable Return on Assets.

The fitted pooled OLS , fixed and random effects models are as follows:

$$Y_i = \alpha_i + \beta_{1_i} X_{1_i} + \beta_{2_i} X_{2_i} + \beta_{3_i} X_{3_i} + e_i \ \ (for\ i = 1, 2, 3, \dots, 41) \quad \text{.....(i)}$$

Where,

Y_i = ROA variable for commercial bank i $(i = 1, 2, 3, \dots, 41)$

X_{1_i} = Institutional innovation variable for bank i $(i = 1, 2, 3, \dots, 41)$

X_{2_i} = Product innovation variable for bank i $(i = 1, 2, 3, \dots, 41)$

X_{3_i} = Marketing innovation variable for bank i $(i = 1, 2, 3, \dots, 41$

α_i = The constant of regression for bank i $(i = 1, 2, 3, \dots, 41)$

$\beta_{1_i}, \beta_{2_i}, \beta_{3_i}$ = The sensitivity of Y_i to $X_{1_i}, X_{2_i}\ and\ X_{3_i}$ respectively for bank i

e_i The error of regression for bank i $(i = 1, 2, 3, \dots, 41)$

To test the statistical significance of each of the regression variablesα_i, $\beta_{1_i}, \beta_{2_i}, \beta_{3_i}$ and $\beta_{4_i}$the T-tests at 95 % confidence level will be used. The F-Test (ANOVA) at 95 % will be used to test the statistical significance of the whole regression. The coefficient of determination R^2 and the adjusted R^2 will be used to determine the strength at which the variation in the independent

variables explains the variation in the dependent variable for each bank. To conclude whether financial innovation in commercial banks significantly affects systemic risk, the number of banks in which the regression analysis is statistically significant must be more that the number of banks in which the regression analysis is not statistically significant.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1.Introduction

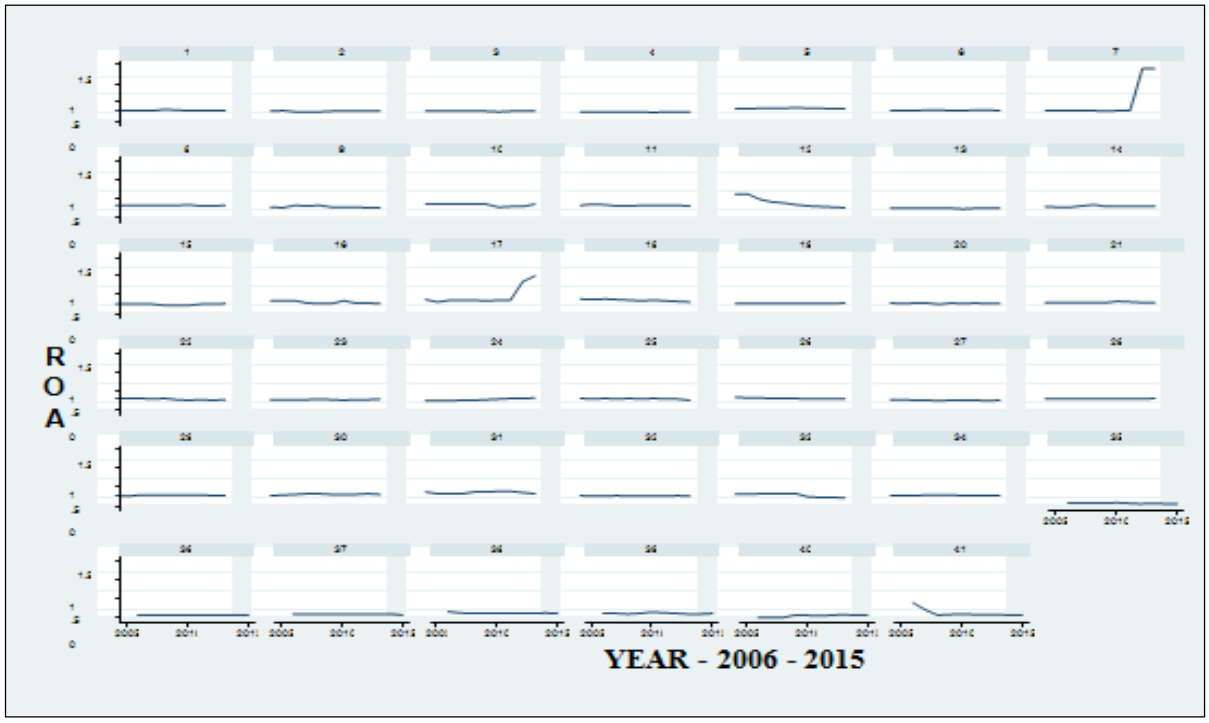
This chapter presents the secondary data collected from the Banks Audited Financial statement of 41 Commercial Banks regulated and supervised by Central Bank of Kenya and those which were operational or in business as at 31st December 2015. Three commercial Banks were under receivership as at close of year 31st December 2015 this were Chester Commercial Bank, Dubai Bank and Imperial Commercial banks and therefore no data was collected from them. It begins with exploratory analysis of the panel data followed by diagnostic analysis. The section on diagnostic analysis examines existence of time related fixed effects, test for significance differences in return on asset across the Commercial Banks, examination of heteroscedasticity and serial correlation and criteria for choosing of random effects versus fixed effects models. In the last section, panel data analysis of the study data is performed to determine the effect of the three independent variables on return on asset. The chapter discuss the key pre-estimation diagnostic tests that were carried out on the data to evaluate its appropriateness for the envisaged analysis. Satisfied with the adequacy of the data for panel data analysis, the author conducted a Hausman Specification test to provide guidance on whether to use the fixed effects model or the random effects model. The fixed effects model emerged as the most suitable model and as such, it was chosen for regression analysis. Finally, post estimation diagnostic tests were carried out to investigate some issues which only become apparent after analysis.

4.2.Exploratory Data Analysis

Before the examinations on whether Expenditure on Institutional innovations , Product innovations and Marketing innovation's on financial performance of commercial Banks in Kenya, exploratory data analysis was carried out through the use of graphical methods. This was primarily to examine whether a panel data approach or a pooled regression approach was best for the data. The results of this exploration were summarized as depicted in the figures bellows. Figure 2 below show the empirical annual growth of return on assets over the ten years period under considerations. The empirical growths depicts that for Chase Bank (7) had an upward trend followed by Equity Bank (17). All the Others Banks depicted a constant growth or slight decline over the period under the study. Although these changes were present, however they did not reflect significant time related fixed effects.

FIGURE 2

Growth Pattern for Each Firm

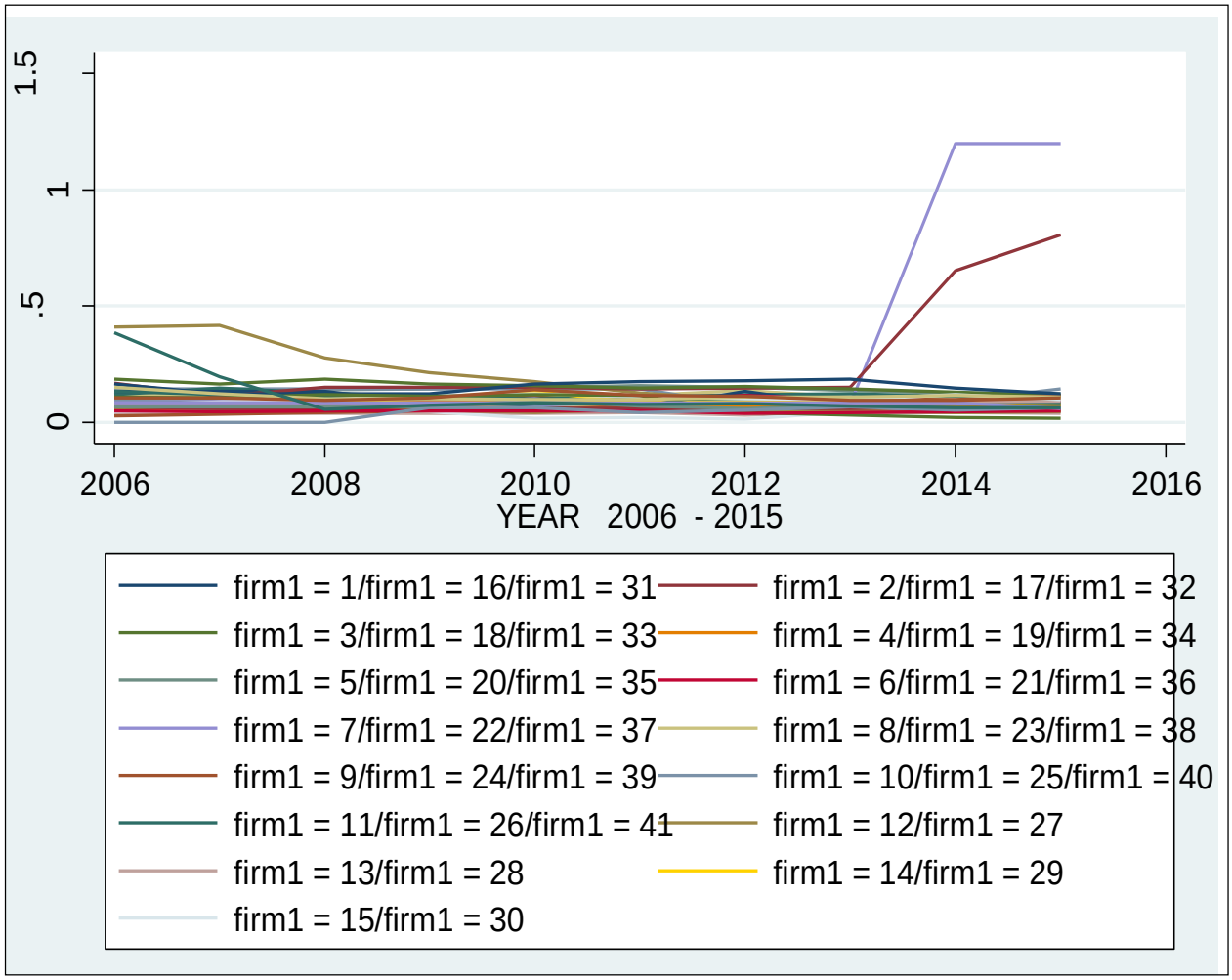


Source: Author (2016)

The pictorial presentations above in Figure 2 shows the panel plot for each observation of the 41 studies cross section over the year 2006 to 2015 period . The purpose of creating the plots was to visualize the statistical, probabilistic mechanism or the data process of curves generated by the time series of the growth of the ROA of each firm. The intercept of the firms under study appeared different, this is illustrated in Figure 3, confirmed the absence of time related fixed effect.

FIGURE 3

Overlain Plot of Return on Assets (ROA)



Source: Author (2016)

4.3.Diagnostic Testing

This section reports on result of the diagnostic analysis of the panel data. Specifically, the section reports on existence of time-related fixed effects and the suitability of fitting pooled regression models vis-à-vis panel data models. The study also examines the presence of heteroscedasticity and serial correlation. Lastly an analysis is done to determine if random effects or fixed effects models should be used.

4.3.1 Test for random Effects

To begin with, we first examined the plausibility of fitting a pooled regression model, which is much simpler than the panel data model. The Breusch-Pagan LM test was used to determine if a simple linear regression model was more preferable than the random effects model. As table 1 below indicates chi-square values for the model were significant ($p<0.001$), implying existence of significant differences of Return on Assets among the Banks. Consequently it was found inappropriate to use simple regression models.

TABLE 1

Breusch Pagan LM test random Effects

```
Breusch and Pagan Lagrangian multiplier test for random effects

        roa[firm1,t] = Xb + u[firm1] + e[firm1,t]

        Estimated results:
                         |        Var      sd = sqrt(Var)
                ---------+------------------------------
                     roa |    .0100322         .100161
                       e |    .0068153        .0825547
                       u |    .0023705        .0486875

        Test:   Var(u) = 0
                                chibar2(01) =     99.55
                             Prob > chibar2 =    0.0000
```

Source: Author (2016)

Since the p value < 0.05, we reject the null and conclude that the data is heteroscedastic and hence the fixed effects model should be used. We reject the null hypothesis of homoscedasticity

and conclude that the data is heteroscedastic and hence the fixed effects model should be used for equation.

4.3.2 Test for Fixed Effects

Next the study examined the presence of time-related fixed effects. If such effects would be present, then one would be required to account for the effects either by inclusion of dummy variables to capture the effects or fitting a two-way random effects model. The results of this test, shown in table 2, reveal that there are no significant time fixed effects ($p>0.05$) thus no need to fit two-way component models.

TABLE 2

Test Results for Time Fixed Effects

```
. testparm i.year

 ( 1)  2007.year = 0
 ( 2)  2008.year = 0
 ( 3)  2009.year = 0
 ( 4)  2010.year = 0
 ( 5)  2011.year = 0
 ( 6)  2012.year = 0
 ( 7)  2013.year = 0
 ( 8)  2014.year = 0
 ( 9)  2015.year = 0

       F(  9,   357) =    1.17
            Prob > F =    0.3106

.
```

Source: Author (2016)

4.3.3 Test for Multicollinearity

Multicollinearity is the study of the relationship between independent variables in a study. It is also viewed as the absence of a strong correlation between two or more independent variables. A correlation matrix is the conventional check for multicollinearity (Field, 2009). The matrix measures the nature and strength of relationship between the explanatory variables informing the

study. To test for multicollinearity, Variance Inflation Factor (VIF) was adopted. VIF quantifies the severity of multicollinearity in a regression analysis. The magnitude of multicollinearity was analyzed by considering the size of VIF. According to Sosa-Eacudero (2009) if VIF = 1, there is no correlation, if VIF is more than 5 but less than 10 , there is moderate correlation and if VIF is greater than 10, there is high correlation. The common rule of thumb is that VIF should be less than 3 (Kutner, Nachtsheim&Neter, 2004). In table 3 below the mean VIF for all the variables in this study is 3.38 hence an indication that all the variables are within the threshold for multiple regression analysis and that there appears to be no excessive multicollinearity amongst the biases.

TABLE 3

Collinearity Diagnostics

Collinearity Diagnostics

Variable	VIF	SQRT VIF	Tolerance	R-Squared
x1	4.52	2.13	0.2212	0.7788
x2	1.94	1.39	0.5152	0.4848
x3	3.69	1.92	0.2708	0.7292
Mean VIF	3.38			

Source: Author (2016)

4.3.4 Test for Serial Correlation

Serial correlation (also called autocorrelation) is a phenomenon which occurs when the error terms of regression variables for successive periods are correlated. When present in a dataset, it can distort the efficiency of regression estimators. Using the *xtserial* STATA addon, which implements the Wooldridge test for serial correlation; the researcher tested this study's data for

the presence of autocorrelation. The null hypothesis for this test is that there is no first order autocorrelation in the panels. The null is rejected if the p value of the test is less than 5%. The results for this test are shown in figure 4 below.

FIGURE 4

Wooldridge Test for Serial Correlation

```
. xtserial  roa x1 x2 x3

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,       40) =     76.414
           Prob > F =      0.0000
```

Source: Author (2016)

For this study, the p value of the Wooldridge Test for Serial Correlation was less than 0.05, implying serial correlation. However, Reyna (2007) notes that serial correlation is not a problem in micro panels but in macro panels, i.e. with long time series (20-30 years).

4.3.5 Test for Cross Sectional Dependence

Pasaran CD (Cross-Sectional Dependence) test is used to test whether the residuals are correlated across entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated. The results of this test are in figure 5 below.

FIGURE 5

Pasaran Test for Cross-Sectional Dependence

```
. xtcsd, pesaran abs

Pesaran's test of cross sectional independence =    15.205, Pr = 0.0000

Average absolute value of the off-diagonal elements =     0.418
```

Source: Author (2016)

Since the p value was less than 0.05, the conclusion is that there was Cross-Sectional Dependence in the dataset. Nevertheless, Baltagi (2009) notes that cross-sectional dependence doesn't distort results significantly in micropanels, but in macro panels (panels with time periods of more than 20 years).

4.3.6 Test for Heteroscedasticity

Heteroscedasticity is a serious problem since it tends to inflate the standard errors, thereby increasing the probability if committing a type two errors, i.e. failing to reject a false hypothesis about a coefficient. The likelihood ratio was used to test the data for heteroscedasticity. The null hypothesis of the Likelihood Ratio test is that the data is homoscedastic across entities, i.e. the error terms have a constant variance. If the null is rejected, the conclusion is that the data is heteroscedastic, i.e. the variance of error terms across entities is not constant. The rejection criteria is that the null of homoscedasticity is rejected if the p value of the Likelihood Ratio test is less than 5%. Figure 6 below shows the results of this test.

FIGURE 6

Likelihood-Ratio Test for Heteroscedasticity

```
. lrtest hetero . , df(40)

Likelihood-ratio test                                 LR chi2(40) =   1062.60
(Assumption: . nested in hetero)                      Prob > chi2 =    0.0000
```

Source: Author (2016)

Since the p value was <0.005, we can deduce that there was a presence of heteroscedasticity in the dataset. Since heteroscedasticity tends to inflate the standard errors, a robust model must be fitted to take into account the effects of heteroscedasticity.

4.4.Descriptive Statistics

The researcher explored the study data descriptively to yield to output in table four below.

TABLE 4

Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max
roa	overall	.0954583	.100161	0	1.1979
	between		.0541207	.0374	.30034
	within		.0846619	-.1379817	.9930183
x1	overall	.5268027	.1765178	0	.9308
	between		.1518497	.05542	.83363
	within		.0927771	-.0115273	.7885327
x2	overall	.1550273	.093222	0	.731
	between		.0718524	.02301	.30409
	within		.0603421	-.0422927	.6483773
x3	overall	.3108529	.1516795	0	.8554
	between		.1295329	.1027	.69664
	within		.0812227	.0221429	.8385329

Source: Author (2016)

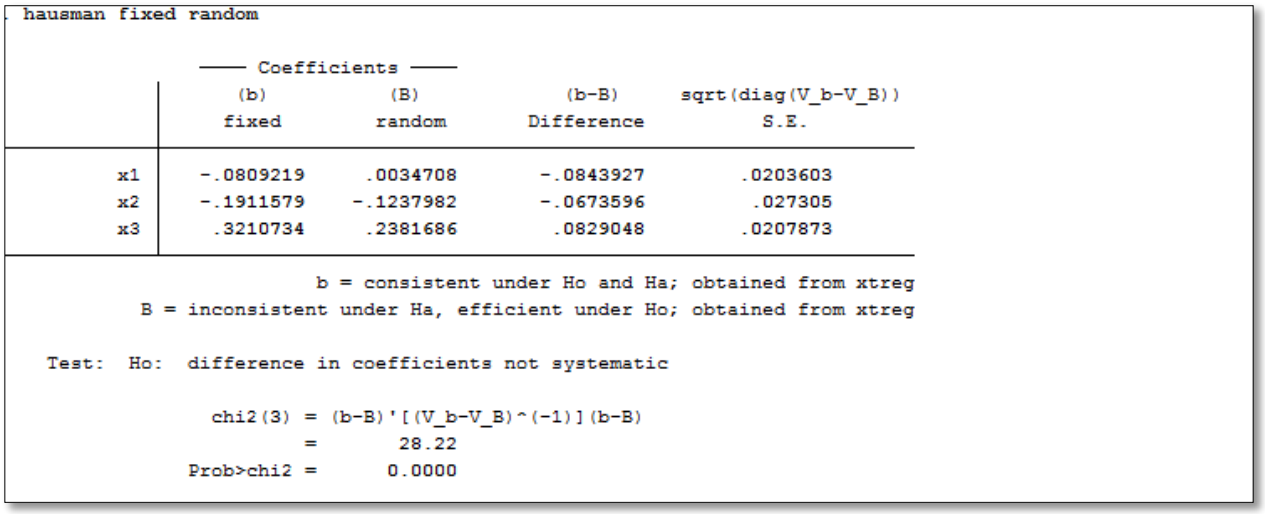
It can be seen that the mean Return on Assets for the sampled Banks was 9.5% with a standard deviation of 0.1. The minimum return on assets was 0% while the maximum was 1.1979. In addition the average Institutional expenditure was 52.68% with a standard deviation of 0.1765. Institutional expenditure had a minimum of 0 and a maximum of 0.9308. The mean expenditure on Product innovations was 15.50% with a standard deviation of 0.093, a minimum of 0 and a maximum of 0.731. Expenditure on marketing Innovations averaged 31.09% with a standard deviation of 0.15167, a minimum of 0 and a maximum of 0.8554.

4.5.Hausman Specification test

In order to be able to decide on the panel regression model to use, the researcher conducted the Hausman specification test. The results of this test are shown in figure 7 below.

FIGURE 7

Hausman Specification test



```
. hausman fixed random

                 ---- Coefficients ----
              |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
              |    fixed        random       Difference          S.E.
--------------+----------------------------------------------------------------
           x1 |   -.0809219     .0034708      -.0843927        .0203603
           x2 |   -.1911579    -.1237982      -.0673596         .027305
           x3 |    .3210734     .2381686       .0829048        .0207873
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       28.22
                Prob>chi2 =      0.0000
```

Source: Author (2016)

This test yielded a p – value < 0.05, suggesting that the fixed effects model was appropriate in this study.

4.6.Robust Fixed Effects Panel Regression

Having settled on the fixed effects model, the researcher fitted the research data using this panel specification. The option “robust” was selected to yield standard errors that are robust for heteroscedasticity since the LR test concluded the presence of heteroscedasticity. Results of robust fixed effects panel regression are shown in table 5 below.

TABLE 5

Robust Fixed Effects Panel Regression

```
. xtreg roa x1 x2 x3, fe vce(robust)

Fixed-effects (within) regression               Number of obs      =       410
Group variable: firm1                           Number of groups   =        41

R-sq:  within  = 0.1491                         Obs per group: min =        10
       between = 0.0019                                        avg =      10.0
       overall = 0.0235                                        max =        10

                                                F(3,40)            = 616746.58
corr(u_i, Xb)  = -0.6047                        Prob > F           =    0.0000

                                    (Std. Err. adjusted for 41 clusters in firm1)
------------------------------------------------------------------------------
             |               Robust
         roa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |  -.0809219   .1301434    -0.62   0.538    -.3439515    .1821077
          x2 |  -.1911579   .2395994    -0.80   0.430    -.6754062    .2930905
          x3 |   .3210734    .249146     1.29   0.205    -.1824695    .8246163
       _cons |   .0679162   .0264301     2.57   0.014       .014499    .1213335
-------------+----------------------------------------------------------------
     sigma_u |   .0772004
     sigma_e |  .08255467
         rho |  .46652215   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Source: Author (2016)

From the results of the regression analysis, equation one can be expressed as:

ROA = 0.0679162- 0.0809219(Institutional Expenditure)- 0.1911579(Product Expenditure)

+0.3210734(Marketing Expenditure).....(ii)

4.7.Hypothesis testing

The hypotheses of this study were framed in the null as follows:

H_{o1} : *Expenditure on institutional innovation in banking has no effect on the financial performance of commercial banks in Kenya.*

H_{o2}: *Expenditure on product innovations has no effect on the financial performance of commercial banks in Kenya*

H_{o3}: *Expenditure on marketing innovation does not affect the financial performance of commercial banks in Kenya*.

Going by the values and levels of significance of the regression coefficient, we therefore reject the null hypothesis in all three cases and conclude that Expenditure on Institutional innovation, Expenditure on product Innovations and Expenditure on Marketing Innovations have no effect on Commercial Banks financial performance.

4.8.Discussion of Findings

Outlined below is a discussion of major findings of the foregoing data analysis. The researcher estimated the effects of Expenditure on Institutional innovation, Expenditure on product Innovations and Expenditure on Marketing Innovations on Financial performance of commercial banks return on assets. The overall regression was significant since the p – value of the F test was less than 5%. The results imply that an increase of one unit in expenditure on Institutional Innovation, should lead to a decrease of 8.09% increment in the return on assets. (p value = 0.538). If Expenditure on product Innovations increases by one unit, the return on assets should decrease by 19.11% (p value = 0.430). Further, a unit increase in the Expenditure on Marketing Innovation should lead to an increase of 32.11% (p value = 0.205) in the return on assets.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter provides the discussion of results of the study as well as the conclusion for this study. The discussion looks at the three objectives of the study and discuss the results in line with the objectives. This chapter also compares and contrasts the results with the extant literature. The purpose of this study was to identify the effect of financial innovation on commercial banks performance.

5.2. Discussion of the three study Objectives

From the analysis the three objectives were accomplished and will be discussed in the sections that follow. The fixed effects panel data model was used for reporting results.

5.2.1 Effect of expenditure on institutional innovation on return on assets

The study results revealed that an increase of one unit in institutional expenditure would lead to a 8.09% decrease in the return on assets. (p value = 0.199). This will positively impact negatively on the overall financial performance of the individual commercial Banks. The expenditure on institutional innovation is this vital for any commercials performance. Predominantly, expenditure on institutional innovation has an effect on financial performance, as well as it impacts on the return on assets of the commercials Banks. This findings concur with a study carried out by Muiruri,JM ,(2014) that banks in Kenya have to adopted the new technologies and modern ways of operating in order to be profitable and have higher return on assets

5.2.2 Effect of expenditure on product innovations on return on assets

The study found out that if expenditure on institutional innovation increases by one unit, the return on assets would decrease by 19.11 (p value = 0.019). On the ground of research results it is evident that product Innovations is statistically significant on commercial Banks performance. However, the decisive significance of amount spend on product innovations means that it is important for commercial Banks in particular its main focus which is to improve the profitability and enhance the shareholders wealth. The results coincide with 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. This is in agreement with studies done by several studies including: Walker (2004); Damanpour (1991); Atuahene-Gima (1996) and Subramanian & Nilakanta (1996) in which in their studies indicate that innovations have positive impact on performance indicators.

5.2.3 Effect of expenditure on marketing innovation on return on assets

The study further noted that a unit decrease in the expenditure market innovations should lead to an increase of 32.11% (p value = 0.0000) in the return on assets. This result is expected since expenditure on market innovations by commercial Banks performance on its income. This is in line with findings by Konak,F (2015) who concluded that there is a some effect on marketing expenditure on firm performance, Financial innovations is the most significant factor that influences performance of commercial banks hence, a slight increase on expenditure on market innovations would lead to increased profits.

5.3 Summary of Major Findings

The research estimated the effect of Expenditure on Institutional innovation, product Innovations and on Marketing Innovations on Financial performance of commercial banks return on assets.

A regression carried out was significant since the p - value was less than 5%. This could possibly be attributed to the small number of the time-series observations in the panel data. The power of a regression analysis increases with increment in the number of observations. The results implied that an increase of one unit in expenditure on Institutional Innovation, should lead to a decrease of 8.09% increment in the return on assets. (p value = 0.199). If Expenditure on product Innovations increases by one unit, the return on assets should decrease by 19.11% (p value = 0.019). Further, a unit increase in the Expenditure on Marketing Innovation should lead to an increase of 32.11% (p value = 0.000) in the return on assets.

5.4 Conclusions

The study concludes that expenditure on institutional innovation, expenditure on product innovations and expenditure on Marketing Innovations on Financial performance of commercial banks return on assets are substantial predictors of return on asset by extension the profitability levels of the regulated commercial Banks in Kenya. These findings indicate that expenditure on marketing Innovations were most important in determining return on assets of Commercial Banks in Kenya.

5.5 Recommendations

Based on the study findings discussed above three recommendations are provided based on the objectives of the study. First given that all the independent variables had both negative and positive effect on return of assets, the study therefore recommends that for Commercial Banks in Kenya need to focus on how their performance relates to returns on assets. This is due to the fact that expenditure on institutional innovation was observed to have a significant effect on return on asset.

Secondly, commercial Banks should ensure that they spend on marketing innovation and on product innovations to ensure that they increase on their performance due to increased

product range have a trickledown effect on the commercial Banks financial performance. Lastly, the study recommends for further study in the subject area of other financial institution other than commercial Banks on the effects of their performance. The current study considered one dependent variable and three independent variable and would recommends another study to establish effects of the performances based on Banks size and equity size that were not considered in the current study on the influence on the financial performance of licensed commercial Banks operating in Kenya.

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APPENDICES

Appendix I: List of Commercial Banks in Kenya

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

39. Trans-National Bank Ltd
40. UBA Kenya Bank Limited
41. Victoria Commercial Bank Ltd

Note

No data was collected from three commercials which were under receivership as at 31st December 2015, this are names : -

1. Charterhouse Bank Ltd
2. Dubai Bank Kenya Ltd.
3. Imperial Bank Ltd