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

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF BUSINESS ADMINISTRATION IN THE

SCHOOL OF BUSINESS AND PUBLIC MANAGEMENT AT KCA UNIVERSITY

OCTOBER, 2019

DECLARATION

I declare that this dissertation is my original work and has not been presented for any degree award in any other University.

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ABSTRACT

The Kenyan commercial banking sector is experiencing unprecedented changes attributable to technological adoption. Currently, tremendous and significant changes are being witnessed in the commercial which have resulted and continues to shock the financial market with diversified, customer oriented financial products. All these changes are wholly or partially driven by the urge of being on top of the market and outdo the wits of their competitors. These technological disruptions have not only been embraced by the institution to increase its profit books but to ensure the dynamic market is well utilized. These changes have made the commercial banks to revitalize their profit driven motive amidst the competitive globalized financial market. The main goal of this study was to determine the effect of financial innovations on the financial performance of commercial banks in Kenya. This research was guided by the following hypotheses which informed the study; Mobile banking, Agency banking, Self-service banking and internet banking have no significant effect on commercial banks performance. The target population comprised all the eight (8) tier one commercial banks in Kenya. Data on their performance with the respective independent variables was sourced from the Central Bank of Kenya (CBK) database. Panel data regression analysis was employed as the methodological tool for analysis. The analysed data was presented using tables, graphs and pie charts. The correlation analysis showed that mobile banking, internet banking, agency banking and self-service banking had a positive relationship with return on assets. The study concluded that mobile banking, internet banking, agency banking and self-service banking have a positive effect on financial performance of tier 1 commercial banks in Kenya. The study recommends that commercial banks adopt other financial innovations in order to increase their financial performance.

Key words: financial performance, innovation, internet banking, mobile banking, self-service banking

ACKNOWLEDGEMENT

I wish to acknowledge my supervisor Dr. Michael Njogo, School of Business and Public Management, KCA University for his invaluable advice, encouragement, patience and guidance throughout the development process of this dissertation.

DEDICATION

I wish to dedicate this piece of work to my loving family, for the support and encouragement that they gave to me.

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ABBREVIATIONS AND ACRONYMS

ATM	Automated Teller Machine
CBK	Central Bank of Kenya
EFT	Electronic Funds Transfer
IDT	Innovation Diffusion Technology
IT	Information Technology
KAP	Knowledge-attitude Practice
NIM	Net Interest Margin
OECD	Organization for Economic Cooperation and Development
PEOU	Perceived ease of Use
PU	Perceived Use
ROA	Return on Asset
ROE	Return on Equity
ROI	Return on Investment
SACCOs	Savings and Credit Cooperatives
SMEs	Small and Medium Enterprises

DEFINITION OF TERMS

Agency banking: The provision of providing limited scale banking and financial services to the targeted client without the presence of the teller but through a contracted person who does not represent the financial institution (Kambua, 2013).

Automated teller machine: This is also referred as cash point machine is an automated money dispensing gadget that has been programmed to ensure customers can have access to their bank's accounts without the presence of a bank teller, assistant or a clerk (Kondabagil, 2007).

Commercial Banks: These are financial institutions mandated with the monitoring and provision of exemplary leadership and performance in the banking sector through undisputable performance in accordance with the financial terms of the country (Erik, 2014).

Credit card: A plastic card which has been widely applied as a debt instrument instead of cash, cheques or even debit cards. The terms for the use of the credit card depends on the owner's worthiness in the bank and whenever its used, its balance is rolled over (Connors, 2017).

Debit card: It's a form of plastic card that has the customer's account details embedded and enables him/her to do her transactions without informing the institution in form of any paperwork (Aden, 2014).

Innovations: These are improved/ advanced way of handling daily operations in the financial industry to ensure that efficiency in terms of service delivery and product diversification is achieved while reducing the cost of operations. Majority of the anticipated changes have been brought up by technology thus disrupting the way of doing things in the financial sector (Aden, 2014).

I**nternet banking**: A web-based modality of banking which enables customers to access the financial services remotely (Titko, 2015)

Mobile banking: The act of using cell phones as the media for transacting all financial services from a bank. It has enabled customers to remotely access financial services at their convenient (Ghodrati and Khah (2014)

Self Service banking: This is a situation where a bank's customers arrange transactions by themselves, without involving bank staff, for example by using ATMs for cash withdrawals (Kaushik & Rahman, 2015).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Technological innovation is a concept that has widely been used in the past decade and has its root from Schumpeter who is believed to be the father of the term innovation (Drucker, 2014). Other scholars globally have been able to reengineer the tern innovation to fit in their context. The banking sector has not been left behind and this has seen many terms like financial technology being used in the present-day financial sector. Urbancova (2013) alluded that innovation in its simplest form could be understood as a product, process or organizational change which does not necessarily result from new scientific discovery but the combination of existing technologies in a new context.

There are different types of innovation that have been adopted by different organisations with the objective of enhancing efficiency and improving their performance. These innovation types include but not limited to financial, product, process, organizational and market innovations. A product innovation is the bringing in of a fresh or considerably upgraded product in relation to its features or proposed usage. This comprises substantial enhancements in technological provisions, product constituents, integrated software and consumer friendly as well as incorporating additional useful features. Process innovations involve adoption of enhanced or novel manufacturing technologies that help the firm to meet customer demands while remaining competitive in the business environment. Process innovations can help the organisation in the achievement of its key performance indicators that include but not limited to reduced operational costs, improved product quality while meeting the customer demands (OECD Oslo Manual, 2005). Marketing innovations involve adoption of fresh marketing

techniques and methods that are geared towards maintaining customer relationship through clear pricing strategies and product promotions (OECD, 2005).

Financial innovation has been an integral component of economic activity for several millennia (Goetzmann, 2009). useful distinction between different types of financial innovations include:

Financial innovations may relate to the product, process or financial system. Financial system innovations affect the financial sector as a whole, relate to changes in business structures, to the establishment of new types of financial intermediaries, or to changes in the legal and supervisory framework. Important examples include the use of the group mechanism to retail financial services, formalizing informal finance systems, reducing the access barriers for women, or setting up a completely new service structure. Financial process innovations cover the introduction of new business processes leading to increased efficiency, market expansion. Examples include office automation and use of computers with accounting and client data management software. Financial product innovations include the introduction of new credit, deposit, insurance, leasing, hire purchase, and other financial products.

About six thousand years ago, the Sumerian city of Uruk blossomed as tradable debt contracts emerged to facilitate a diverse assortment of intertemporal transactions underlying increased specialization, innovation, and economic development (Goetzmann, 2009). In ancient Rome, private investors steadily developed all of the features of limited liability companies, including freely traded shares, an active stock exchange, and corporations that owned property and wrote contracts independently of the individual shareholders. The creation of these corporations eased the mobilization of capital for innovative, large-scale mining technologies (Malmendier, 2009) and improved accounting systems to foster screening by distant investors.

The role technological innovation is playing in the banking industry in the 21st century remains undisputable. Economic growth is highly driven by winning new customers and increasing the organizations performance (Urbancova, 2013). Innovation presents a myriad of opportunities to any organization that adopts and gets ready for it. The wave at which innovation in the 4th industrial revolution is setting in, for any organization to spur its growth, innovation cannot be ignored (Kurgat, 2011).

World Bank report (2015) on financial competitiveness and innovation, the world of today is at an auspicious turning point. A point which is the World Bank Group is calling for equity and alleviation of poverty amongst the low-income group who are living below 1 dollar a day. The awakening call and huge capital allocation in form of concessional grants has been one of the accelerating forcers behind the financial institutions to adopt innovative practices to ensure that they achieve financial inclusion. The adoption of such practices in return has implications to these institutions which this research addressed.

In the past few years, the financial innovation adoption has shifted from the West which has dominated the fintech market for a long time. This is being evident with global shift from the use of Banks to Snaps as a mode of payment. In South Africa the Thisisme platform has been developed to ensure due diligence is done within few seconds thus enabling accessibility of finances as opposed to months in the past (Incestec, 2019).

Mckinskey (2018) noted that African Banking markets globally have been identified to be amongst the leading exciting scenarios. He alludes that the African Banking Market has emerged to be the second- fastest growing as well as the most profitable banking market globally. The driving force for new frontiers in the African Market has been attributed to less penetration and less concentrated market with huge chunks of cash circulating and low regulations. This has seen innovation as the only sure path to go through to ensure that the investors reap as much as they can from the Market. There are sleeping giants in Africa whose

financial market is performing way much below the expectations due to myriads of Challenges. Countries like Nigeria and Angola have been ground to have poor retail banking performance than expected. To counter the effect, adoption of mobile banking has seen such countries to be the frontiers of the future financial hub in Africa as a result of innovation adoption.

The increased diversification of financial technology in Kenya is growing at unprecedented rate. Despite the increased competitiveness, the commercial banking sector like any other organization, continues to operate in a challenging environment which is calling for adoption or if not so total disruption of the system by natural forces. The magnitude and the criteria of adoption have highly been driven by innovation which have ordinarily resulted to either positive or negative impact (Waweru & Kalani, 2008).

Majority of the commercial banks in Kenya have invested in information technology a scenario which has resulted to diversification of their operations. Coupled with other market forces and competitors who are acting against them in the small market, technological innovation has not been well embraced especially with the dawn of the online lenders who to a great extent are negatively influencing the commercial banks performance in Kenya. Many online platforms apart from the M-pesa platform offered by Safaricom known as M-Shwari loan, there are over 100 online money lending apps without collaterals which in one way or another have affected the commercial banking sector. The metamorphosis and transition behind all what is being witnessed in the banking sector in Kenya is largely attributed to financial (Njoroge, 2017)

Kenya Electronic Payment and Settlement system grew the value and volume of the transactions in the banking sector (Kinoti, 2015). Internet banking is at the helm of the commercial banking sector with high percentage of the population in Kenya having a smart phone which has saved them from long queues in the banks and delayed transactions(Wanjohi, 2017).

According to Tufano (2012) and Lawrence (2010), the aim of an innovation is the development of new process or products by a firm in order to enhance operational performance where products (new) are based on different and uptodate processes. Based on the assertion of Solans (2003), in the financial services industry, innovation is viewed as the act of creating and popularizing new financial instruments, technologies,institutions and markets, which facilitate access to information, trading and means of payment. Lerner (2002) puts forward that innovations are not just critical for firms in the financial services industry, but also affect other companies; for instance, enabling them to raise capital in larger amounts and at a lower cost than they could otherwise and that innovation is an important phenomenon in any sector of a modern economy.

The Kenyan financial sector has experienced tremendous dynamism over time. A great deal of changes has been embraced in the area that have prompted expansion of money related items, exercises and hierarchical structures that have enhanced and expanded the productivity of the monetary framework. Advances in innovation and changing financial conditions have necessitated this change.

Gorton and Metrick (2010) sum up and outline reasons for the grown in the modern financial innovation and list them as follows; lessening in insolvency costs, impose points of interest, diminishment in moral danger, decreased administrative costs, straightforwardness and customization. A tremendously turbulent budgetary condition raises effective advancement which achieves an outstanding aggressive position and favorable position which prompt an unrivaled execution. Financial environment must be kept by nonstop and predictable change of the item and the procedure. It is critical to note that financial innovation has greatly affected the financial market due to it opening up new and big opportunities for the stakeholders and has further opened up and increased new market which has come about as a result of new products.

Financial innovations arise due to several reasons (Batiz-Lazo & Woldesenbet, 2006). Gorton and Metrick (2010) and Batiz-Lazo and Woldesenbet (2006) summarize the reasons for the growth of modern financial innovation as; reduction in bankruptcy costs, tax advantages, reduction in moral hazard, reduced regulatory costs, transparency and customization. A highly turbulent environment leads to successful innovation creating a unique competitive position and competitive advantage and lead to a superior performance (Roberts & Amit, 2003). This can only be maintained by ceaseless innovation and improvement of the product and the process (Porter, 2004).

Financial innovations have revolutionized the business processes in the banking industry through new processes and products as found by Yin and Zhengzheng (2010) who demonstrates evidence that Chinese commercial banks have moved from the traditional business operation mode; the wholesale credit operations to the retail mode as a result of technological innovations. In India, Pooja and Singh (2009) conclude that internet banks were larger, more profitable, had higher asset quality, lower administrative expenses and were more efficient compared to the non-internet banks. In Jordan, e-banking resulted to more satisfied customers and better long-term cost saving strategies (Siam, 2006).

Mabrouk and Mamoghli (2010) in their research on financial advancement changes and how they relate to how the banking firms perform. The found that return on assets is positively and significantly related with the first mover and imitation of product innovations in the Tunisian banking industry. In Ghana over time, technology has increased in importance in Ghanaian banks and has transformed the way banks would serve their clients more conveniently and in the process increase profits and competitiveness while the most revolutionary electronic innovation in Ghana and the world over has been the ATM (Joshua, 2010). In Nigeria, internet banking has resulted to improved e-Commerce and e-Payment services with overall reduction in the amount of

currency in circulation (Chiemeke, Evwiekpaefe & Chete, 2006; Ayo, Adebiyi, Fatudimu & Ekong, 2008; Aderonke & Charles, 2010). In Mauritius, Padachi, Rojid and Seetanah (2008) observe that the two main banks; Mauritius Commercial Bank and the State Bank of Mauritius improved their financial performance on implementation of new technology.

Gardachew (2010) document that Ethiopian banks have not been able to achieve efficiency as a result of slow adaptation of technological innovations. In Uganda, adoption of electronic and mobile banking has increased access to banking services (Porteus, 2006). In Kenya, effective use of Information Technology [IT] has led to better utilisation of personnel and organizations assets, increased revenues and increased access to financial services by the general population (Mwania & Muganda, 2011). Ndung'u (2011), concurs that in only four years (2007-2011) of the existence of mobile phone money transfer services in Kenya; four mobile phone operators are in place with 15.4 million customers and over 39,000 agents. Total transactions in 2010 averaged Ksh.2.45 billion a day and Ksh.76 billion a month resulting to lower transaction costs and increased access to financial services. This depicts a very productive market for electronic money transfers (Ndung'u, 2011).

1.1.1 Financial Innovation

According to Ignazio (2007), financial innovation entails the process of developing new financial products and establishing new ways of delivering the already existing services in the banking institutions. Noyer (2007) defined financial innovation as the entrance of new products to the designated customers in the financial market. These two definitions portray how technology could be adopted to better the operation of financial institutions to ease the operations and improve customer relations with the banks.

Financial innovation has been defined as the process where firms in the financial sector are equipped with capacity to establish new and improved capacities while at the same time

increasing utility (Drucker, 1985). Frame and White (2002) outlines that financial innovation can stem from three areas in the banking sector namely: institutional, product and processes. These to a large extent forms the types of financial innovation being witnessed today in the banking sector. The choice of innovation adopted can adversely affect the traditional way of ding activities.

Drucke (2014) believed that the management nature of any institution can highly be influenced by innovation. The financial sector can be affected by the institutional innovations and this is as a result of the establishment of new types of financial intermediaries or changes in the legal and supervisory framework. OECD (2005) states that product innovation entails the introduction of relatively new goods and services that are aimed at fastening the process of commercial banking. OECD (2005) report indicated that the art of innovation in the financial sector is multifaceted in the sense that it can stem either from the product, customers, the management and the institution itself. The sole purpose for the involved stakeholders all aimed at improving the quality of services rendered by the institution. They believed that the diversification could be greatly achieved through the cooperation of new ideas to the existing ones and embracing change.

Financial innovation is done by firms in three ways: on the institution, on the process, and on the product (Frame & White, 2002). Innovation relating to the institution is based on new methods of conducting business, changes in the working conditions and new ways of relating with the shareholders. Institutional innovation influences the way financial institutions operate through introduction of agents or joining hand with other firms with products/systems that would support their business. The innovation becomes an option where the government changes laws, supervisory framework and introduces minimum capital requirements.

On the other hand, innovation relating to product itself is common in the financial sector (OECD, 2005). This kind of financial innovation involves the development of new and

improved goods or services based on their usage and characteristics. Innovation based on the product is based on its usage, new information or methods, and/or a mix of both methods and usage. Innovation can also be based on business processes. This involves a financial institution introducing business processes that are different from the current and new in terms of its efficiency. This kind of innovation increases the efficiency of a firm. It also enables the firm to expand their markets while at the same time lowering operational, distribution and production costs. This kind of financial innovation supports the product innovation where it enhances the delivery of new products that are better than the existing products (OECD, 2005). A good example of process innovation is automation of the office operations and the usage of alternative channels in the distribution of services or products.

Technological innovation has been revolutionizing the operations in the Kenyan banking sector. If business goes on as predicted in the coming decade performance in the banking sector will be driven to a large extent by technological growth. Those banking institutions which are sluggish towards technological adoption are highly likely to be faced off the market (Njoroge, 2017). Some of the outstanding financial innovations being witnessed in the Kenyan banking sector are use of automated teller machines, mobile banking, internet banking and agency banking (Manoranjan, Bhusan, Kanta & Suryakanta, 2012).

The role internet banking is playing today is proving to be undebatable. According to Manoranjan, Bhusan, Kanta & Suryakanta (2012), internet banking is improving customer's relation, reduced operational costs, reduction of bankruptcy costs, reduction in the regulatory costs, increased transparency and profit margins have grown. The use of automated teller machines (ATMs) since their inception in the early 1990s in Kenya has increased tremendously as observable from the Central Bank of Kenya (CBK) which is the institution in Kenya vested with powers to regulate the financial sector. According to Kenya's financial overseeing institution which happens to be the CBK, there is already approved use and the application of

Internet of things in the financial market like the adoption of Electronic funds Transfer (Ignazio, 2017).

1.1.2 Financial Performance

Organizational performance is defined as the measure of how an organization achieves its maximum profit/output from the use of its scarce resources (Amalend, 2012). It solely aims at achieving the organizations mission through sound management, strong governance and rededication to achieving results (laforet & Li, 2005). According to Amalend (2012), financial performance can be defined as the process of evaluating the operational and financial characteristics of an organization with the sole purpose of determining its efficiency and performance with the reference to its financial records and reports.

Williams (2013) postulated that financial performance has been measured and reported in all sectors of the economy globally. The methods of measuring and reporting financial performance has happened in both public and private sectors. It has also been a key business practice in the developed and developing nations. He further posits that the measurement of financial performance is mainly done based on the KPIs (Key performance indicators). The KPIs are indicated to be the source of intelligent reports on how a firm (either private or public) has performed financially across a certain period of time (Williams, 2013). Moynihan (2015); Vakkuri and Meklin (2016); and Modell (2014), supports the assertion where they indicated that firms need performance measures that would give them an overview of the financial position of the firm. DeKool (2014) supports the use of KPIs as an intelligent measure of financial performance. He posits that KPIs are a good management tool that would enhance financial efficiency through objective and rational financial decisions. This is due to the quantitative nature of KPIs. Ingraham (2015) supports the usage of KPI as a performance measurement and reporting tool due to its applicability across sectors and nations. It is also easy to understand and interpret for the common mwananchi.

Moynihan (2015) posits that the explanation of the financial performance of a firm is based on the proficiency in the amount of money used. It is also based on the financial objectives and the extent to which they are and have been met. Modell (2014) indicate that financial performance is the methods in the measurement of how a strategy influences the operations of a firm in financial terms. It is based on the post effect calculated using financial ratios. DeKool (2014) postulates that financial performance quantifies a firm's financial health based of a certain period of time. It can be done comparatively in an industry or across industries or mergers and acquisitions. This shows that financial performance is key to understanding an organization's general health.

The measurement of financial performance is key to commercial banks (Ahmad et al, 2011). They contend that in order for the banks to experience benefits from financial performance measurement they have to base their financial performance measurement on revenue and operational costs. McKay and Pickens (2010) contends that in order to enhance their performance and increase their revenue, banks have expanded their revenue sources from direct (on counter) to non-direct like use of agents, internet and mobile banking services. This has enabled the banks to survive in the financial sector which is dynamic and full of rivalry.

Vakkuri and Meklin (2016) posits that for banks to stay competitive and perform better, there is need for them to adopt new ways of doing business and creating new products by utilizing available technological innovations. This includes adoption of financial innovations like electronic banking and creation of products directed to specific groups like Islamic banking.

The banking sector represents the main source of credit for economies across the globe (Cicea & Hincu, 2009). Commercial banks create a wave of financial flows in the provision of credit facilities to sectors of the economy. When firms and government get credit form the banks, they create financial flows that in turn creates in countries a rampant economic growth

and development. This shows that the financial status of commercial banks is key to any economy. This creates the need for the banks to ensure that they have efficient systems to measure their financial performance. The financial performance measurement should also be done periodically in order to ensure that the financial objectives are evaluated and met. The measurement of financial performance enables the banks to understand where the bank is facing in terms of its financial standing and at the same time predicting the expected performance after a period of time.

Dardac and Barbu (2015) posits that financial standing of a firm is mainly measured through profitability ratios. These ratios give information on the capacity and ability of the firms in mitigating financial risks and expanding its activities. The key ratios relating to a firm's profits include but not limited to return on invested capital, return on assets, return on equity, and return on investment. Ceylan, Emre and Asl (2008) supported the use of profitability as a measure of financial performance of a bank. They support the use of return on firm's assets, EBIT, and ROE where they note that a bank with high returns on its equity experiences high returns on its assets.

Leverage ratios are also used in measuring the financial standing of a firm. They include debt and equity ratio. Greuning and Bratanovic (2014) notes that indicators of financial performance are calculated based on a number of years, months or quarters which creates an understanding of the changes in the financial ratios. The changing ratios enable the banks to make timely decisions while at the same time formulating and implementing strategies for improved general performance.

Ichniowski et al. (2011) identified market share as another indicator of a financial institution growth. He outlines that the indicator may not only reflect to the institutional growth but a shadow of its competitiveness in the market. Murthy and Mouritsen (2011) outlined several measurements of financial performance in financial institutions such as: Return on

Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM). The ROE is a financial indicator which shows how much income an organization generates in relation with to its total amount of shareholder equity share in the organization investment.

Khrawish, (2011) in his study on the performance of commercial banks defines ROA as the ratio of income to its total assets, an indicator of the ability of the banks leadership capability to generate profit through proper utilization of the institutional assets. ROE will be used in this research to measure the financial performance of commercial banks in Kenya.

Based on the assertions of Batiz-Lazo and Woldesenbet (2016), banks use innovative financial practices in order to create a competitive edge and enhance their financial performance through reduced costs. innovative financial practices are also adopted by banks in order to expand their markets and enhance operational efficiency. This makes it fit for the researcher to study financial innovations and how they influence performance of banks.

Roberts and Amit (2013) asserts that successfully implemented innovations increases the competitiveness of a bank. This happens through increase in competitive advantage, superiority in financial standing, and increased firm value. Porter (2014) adds that continuity of innovative practices and strategies coupled with improved products and processes creates a competitive position of a bank. Despite this, there is a misunderstanding on financial innovations in banking and how it relates to financial performance. This is based on low understanding on what drives innovative practices in banks and how the practices may affect financial ratios of the banks. There is also lack of wholistic approach to innovation and how it impacts on financial performance. This is based on the fact that firm characteristics like firm size and macro variables like GDP may affect the two hence creating complexity in the relationship between the two variables.

1.1.3 Commercial Banks in Kenya

The commercial banking segment in Kenya is comprised of 40 banks which are divided further into three broad categories using a predetermined composition comprised of their net assets, Clients inflow, capital and reserves, share of deposits and the loan portfolio. Based on the defined criteria, those banks whose composite weighted index is greater than five percent are classified as large group banks (or tier 1 banks). Those banks with a weighted composite index of between one to five percent are classified as medium group banks (or tier 2 banks) while those with less than one percent weighted composite index are classified as small group banks (or tier 3 banks). Currently, in Kenya there are 8 tier 1 financial institutions, 11 tier two financial institutions and 21 tier three ones (CBK, 2018).

Over the past few years, the commercial banking sector has witnessed unprecedented shift in the market share segment. According to the CBK (2017) report, in the financial year ending 2017, those financial institutions under tier one category grew their market from 65.3% to 66% during the 2026/2017 financial period. The increase in market share was highly attributed to the increased customer's deposits which is expected to continue with the same trend until 2020. Similar trend was observed in the middle peer group which recorded an increase from 26% in December 2016 to 26.10% in December 2017. However, the market shares of the small peer group saw a fall in their dominance with a whopping 1.5% which was translated as a decrease from its previous financial year from 9% to 7.5%. The reduction in the market dominance is highly correlated to the merger of two tier three financial institutions by both tier one and two in the same financial year.

According to the CBK (2017) report commercial banking sector capital and reserves grew by 7.8%. This increase was attributed by increased deposits in the large and medium peer groups unlike the small groups which registered a decrease. Over the same period the commercial banking sector profit decreased by 9.2%. The decline in profit margin has been

attributed to increased expenses in the sector as compared to the decrease in income of the customers. It was similarly found that the income in the banking sector declined by 3.12% whereas the expenses increased by 0.5% over the same period.

CBK (2017) report shows that the tier one category contributed to a whopping 81% of the total pre-tax profit which grew by 3 % from the previous accounting period. The tier three financial institutions tax records showed that there was a decline by 3.5% which was as a result of massive losses experienced by 8 financial institutions as compared to 5 institutions in the previous year. The tier two category medium peer group proportion of total pre-tax income witnesses a decline of 0.5% in comparison with the previous financial year. The decline in the income had its sources from the loses which increased to three institutions as previously compared to two. Over the same period, there was increased customers deposits portfolio recording a whopping 10.75 %. The CBK attributed the increased number of daily transactions as a result of technological innovation adoption to diversify the institutions products to the increased income.

Similarly, the same scenario was recorded in the Self-service banking system which recorded a growth in the number of ATMs nationwide. The desire to offer doorstep services to their clients saw the institutions increase the ATM network coverage from 2,656 in 2016 to 2,825 in 2017. The 2016/2017financial period was marked as the most successful one in establishing of the self-service banking technology over the past decade. It's worth concluding that the financial leadership had a well-orchestrated strategic decision to ensure that they devolve their services especially to the financially marginalized areas. This is a clear indicator and measure of innovation adoption in the commercial banking sector. The increase in the self-service banking points is a good picture of how financial innovation has been embraced by the financial institutions in a nutshell.

1.2 Statement of the Problem

Tier one category of commercial banks financial performance declined by 0.5% in 2018 in comparison with the previous financial year (CBK, 2018). However, over the same period, there was increased customers deposits portfolio by 10.75 %. CBK attributed the increased number of daily transactions as a result of technological innovation adoption to diversify the institutions products to the increased income (CBK, 2018).

Financial innovation is proving to be the most suitable tool to unlock the potential of unpenetrated retail financial Markets. According to the world of today is at an auspicious turning point where those market that were untapped in the past are proving to be the future frontiers. To harness this potential, financial institutions have leaned towards innovation as the only way to ensure that the retail market is well exploited. This has seen financial institutions to be in the front line to adopt financial technologies which have been duped fintech's of the century. These technologies have huge implications to the institutions (Aduda & Kingoo, 2012), and this motivates this study to determine the effect of the adopted innovations in the commercial banking sector in Kenya.

According to the world bank, there has been increased flow of innovations from the West to Africa and Kenya has not avoided the trap. These innovations are changing the way operations are carried out in our financial institutions the information about the precarious effect they pose to the commercial banks remains scanty thus motivating the research to dig further into the issue and keep the public well informed so as to further induce critical policy measures that in the future might cushion the sector from the effects. Research on innovation (financial) and financial performance has produced mixed outcomes. Aker and Mbiti (2010) established a strong negative relationship exist between financial innovation and financial performance of commercial banks, while Sewing et al (2014) established a positive relation.

These mixed findings create the need to investigate how financial innovation affects financial performance.

1.3 Objectives of the study

1.3.1 General objective

To establish the effect of financial innovations on the financial performance of commercial banks in Kenya.

1.3.2 Specific Objectives

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

ii. To investigate the effect of internet banking on the financial performance of commercial banks in Kenya.

iii. To find out the effect of agency banking on the financial performance of commercial banks in Kenya.

iv. To determine the effect self-service banking on the financial performance of commercial banks in Kenya.

1.4 Hypotheses

H_{01}: Mobile banking has no significant relationship on the financial performance of commercial banks in Kenya.

H_{02}: Internet banking has no significant effect on the financial performance of commercial banks in Kenya.

H_{03}: Agency banking has no significant effect on the financial performance of commercial banks in Kenya.

H_{04} Self-service banking has no significant effect on the financial performance of commercial banks in Kenya

1.5 Significance of the Study

The results from this study proves to be a game changer in the commercial banking institutions through provision of knowledge on the usefulness of innovation to overcome the challenges that are posing threat to them through product diversification to yield high return from the assets. This creates an enabling environment for the management of the institutions to increase effectiveness and efficiency thus reducing their operational cost which in turn results to achieving the mission of the institution of profit making.

The research results also shows the undisputable role of the government in putting into place policies that creates an enabling environment for innovations and technological disruption in the financial market. Such policies could be drawn to ensure the macro and micro environment of the financial institutions promotes innovativeness in the commercial banking sector while establishing stringent measure on those found engaging in activities that are in contrast to the financial innovation ethics.

Lastly, the research outcome forms a strong background and reference source for other scholars who have interest in unlocking the puzzle between the financial institutions and the 4^{th} industrial revolution which proves to be the future direction of the financial market.

1.6 Scope of the Study

This study lays strong emphasis on the eight tier one financial institutions as gazette by the CBK as of December 2017. The study focuses on four thematic areas including and not limited to: mobile banking, agency banking, internet banking and self-service banking. The research employs both both primary and secondary data. The secondary data was drawn from the records of the financial records as from 2012 to 2018.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical background

Innovation literature holds that innovation is the most fundamental source of any organizational success. It increases organizational competitive advantage in such a competitive and complex globalized world. Several theories have been put forward to elucidate how innovation has impacted the success of organizations.

2.1.1 Innovation Diffusion Theory

According to Rodgers (2003) innovation can be understood as a gradual process which encompasses the process of creating or development of new product, service or even a gadget. Rodgers came up with the Innovation diffusion theory (IDT) in 1962 when he explained the relationship between new product development and the time it takes to be accepted in the market. In his argument, Rodgers believed that new idea conception took time for the target customers to be convinced. One outstanding weakness of this theory is how todays financial innovations are venturing the market in a couple of days. This is being witnessed in the mobile banking sector where customers are not giving it a second thought to activate their ussd in order to transact.

Their counterparts who are connected to the internet are moving swiftly to ensure they benefit from the connected devices. Rodgers was categorical in highlighting that innovation does not occur simultaneously but as a process where some people are apt to adapt to the process whereas others take time (Rodgers, 2003). The same process has been evident in the financial organizations where some of the commercial banks adopted technology instantly and others took longer time to adopt to innovation.

In IDT, Rogers was able to outline different phases which one or an institution can go through in order to adopt an innovation. One key stage he did outline was the innovation decision process where customers or a targeted financial institution goes into self-assessment for the need of applying the new idea or a device in order to smoothen their operation. This idea is valid in our today's society where customers especially in the banking sector are eager to realize the importance of any technology before they conclude to use it. This stage is very crucial and in today's commercial banking sector it can act as part of the strategic management tool to ensure the institution does not incur losses in the future. The stage being a gradual process ends with the act of attitude formation about the innovation (Demir, 2006). Demir supported the idea of Rodgers when he integrated the idea of decision making and attitude acceptance to embrace the changes in the organization.

Demir (2006) in the formulation process of this theory was able to discover out that several stages are involved for any organization to adopt financial innovation. He espoused five critical stages. One key outstanding stage he was able to identify was the knowledge based where he outlined that it's in this stage where an individual or an organization is exposed to technology and how it influences his enterprise. This part of the theory is very crucial to this study for informing the chosen financial institutions on the essence on understanding the importance of knowledge transfer to their clients whenever a new financial innovation is being launched. (Demir, 2006). Its at this stage where an organization creates awareness to its target customers which has been paramount in today's financial technology competition where institutions are spending chunk amounts of money on marketing the anticipated financial innovation chosen (Rogers, 2003).

Rodgers (2003) noted that another vital and bold step to be envisioned after awareness creation is how to ensure the customers are won into the desires of the financial institution. This is raised with the sole purpose of overcoming the attitude clients can have towards a new

idea in the market. After due diligence institutions have to embrace on how to change the mentality of their customers and being able to bring them into their inner circle of operation (Rogers, 2003). Once awareness has been created, its very crucial for the financial institution to walk the talk with their customers is embracing the decision-making process. This is achieved by choosing which scenario presents the organization with an array of advantages. Embracing decision making in this study will play a crucial part by elaborating to the tier one financial institutions on its importance when they choose to make such a decision in financial technological adoption (Rogers, 2003).

According to Rodgers school of thought and the postulation of his theory, once the wise decision on financial innovation has been made by an institution, it's worth moving higher and implementing it. There are always repercussions that comes with any decision made and its very crucial for the financial institutions not only to implement any decision to compete with their rivals but with the sole purpose of profit making in mind. In the process of implementing a decision, many financial institutions have been faced by an array of cropping challenges related to that decision and the only sure way to solve it embracing new ideas or changing completely on its way of implementation which in this case is financial innovation. (Rogers, 2003).

Rodgers believed that once a decision has been implemented and confirmed to be successful, any organization grows into the helm level where the organisations mission and visons are attained, and the management are at peace with the new change embraced. This aspect of conformation will reduce the issues that arises with adoption of technology. Confirmation stage harmonizes the effect of financial technological innovation adoption when the institution does not meet its achieved target. It's a crucial tool for financial institutions to implement as a cushioning agent against when technology moves beyond the company's expectations. (Rogers, 2003).

Based on Innovation Diffusion Theory which explains that the characteristics of innovation are the nature of the diffusion of innovation, where the characteristics of innovation are one that determines the successful use of technology. So, commercial banks in Kenya need to understand the characteristics of the financial innovations for successful use for improved financial performance. This theory is very useful to the commercial banking sector in the sense that the target customers of the financial instructions might not but the new product in the market instantly. Customers at times can be reluctant especially when they are not sure about the effect of a new product. This informs the commercial banking sector that in the initial phases of product launch, it might take long period and incurring losses through heavy investment on information and marketing their product. This phase should be embraced and critically handled as it's a key determinant of how the chosen innovative practice will be accepted.

2.1.2 Technology Acceptance Model

Davis (1989) outlines that research has proved that there are two key determinants for the information technology acceptance by an individual or an organization. He identifies Perceived Use (PU) and perceived ease of use (PEOU). He defined Perceived Usefulness as the extent to which an organization believes that the application of a system will improve its performance. This has highly been applied in the commercial banking sector where new systems have been tried by the management with the sole purpose of increasing the marginal profit. It's an indicator of how people perceive an innovation and its impact on their organization (Davis ,1989).

The usefulness alone is not a clear indicator whether a practice is a technology or an innovation. A technology can be usefulness to the organization and improve its performance but in return it's not user friendly to its customers. This elaborates the necessity of coming up with innovations which are user friendly to the target customers. One key enabling feature in

the commercial banking has been the mobile banking where commercial banks have been able to partner with telecommunication providers in Kenya and offered the low class Kenyans who are not conversant with advanced computer skills like the ATM with the ussd codes to dial in their analogue phones. These ussd dialling code has been of ease to use to the target customers. Davis (1989) defined PEOU as the extent to which organization and their customers will not feel the effort of using a system. It's crucial for any organization to ensure they strike a balance between PU and PEOU to achieve improved organizational performance and customer satisfaction (Davis1989)

According to Wang *et al*..,2003 the ease of use for any new idea in the market is highly correlated to its acceptance. This presents an analogy to the commercial banking sector in the sense that whatever coming up with a new financial innovation in the market, its crucial to ensure that its in its simplest form to ensure that those customers who have less skills are able to use and operate it in their convenience. This model has widely been applied by the Equity bank whereby by targeting the low middle class whom majority have no literacy skills but have been able to use their new ideas due to their simplicity and ease in application. This is an awakening call to all financial institutions in ensuring that whenever they launch a new product, it must be built with its base on their customer's needs.

The modernity under which this model presents itself to the target customers, builds increased trust to their service provider. This is an added advantage to the banking sector during the time of adversities. Wang *et al*. 2003 emphasizes on the application of this model in any organization due to its effect high chances of increasing the competition between to rivalry institutions (Wang *et al*., 2003).

This theory acts as a backbone for the development of the anticipated technological innovation product. It equips the commercial banker with the prerequisites to which the bank must ensure while offering any product to the use. This theory is very critical in this study

especially for the self-banking technologies where they should be designed in such a way that the they cut across from all the users of the institution with ease. For mobile banking, the developed applications should be user friendly to ensure the illiterate and semiliterate groups are not excluded form the innovation. If need be, the commercial banking industry should ensure that there is an alternative to the complex practices which can be used by simple gadgets for those population groups who cannot access the digital gadgets.

2.1.3 Transaction-Cost innovative theory

The transaction innovation theory was put forward by Hicks and Niehans (1983) when they argued that the purpose of financial innovation is solely reducing the cost executing operations in any organization. The reduction of the transaction/operational cost has a ripple effect and simultaneously result to increased efficiency in service delivery in the institution. In their work they expound the role of financial innovation as driven by profit maximization. The theory's motive further explains another perspective relative to the radical motive of financial innovation of firms' purpose of earning shareholders' wealth or benefits (Hicks & Niehans, 1983).

Critics to this theory have it that the theory proposes for a varied view of the underlying goal behind financial innovation resulting into increased efficiency or profitability. They held that the use and adoption of ICT in the financial sector contributes immensely towards cost reduction in the sector due to efficiency derived from the use of the innovations. Present day commercial banking sector where financial banking like mobile banking, agency banking, online banking and ATM adoption has been fully implemented, the operational costs are highly likely to have reduced (Hicks & Niehans, 1983).

Hicks and Niehans (1983) 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 financial performance. 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 institution's purpose of earning benefits.

The transaction-cost innovative theory is very important to any financial institution as it forms the basics of cost reduction. To be able to understand the effect of all these financial innovations in the tier one banks which are solely established to reduce the operational costs, it forms the basis for any institution to first ensure that due diligence for any practice or an idea aimed at increasing the institutions efficiency and performance, its implications costs should not go beyond how the institution was doing without it.

2.1.4 Regulation innovation theory

The Regulation innovation theory was postulated by Silber (1983). He alluded that financial sector sole purpose of profit maximization to be the driving force for financial innovation. The environment surrounding any organization has both micro and macro factors which determines the success of the institution. In the financial sector, Silber outlined that factors such as policies, statutory regulations, organizational structures and management presents impediment in the journey to achieving profit maximization (Silber, 1983).

When adopting the innovations to set up in the commercial banking sector, it's of great importance to consider what are the regulations that might limit the application of the desired innovation. Despite the crucial role these environmental factors that present to the security and stability of the financial organization to set up an enabling working environment, they might derail the efficiency and effectives of the financial organization thus there is need to innovate against them to ensure that the full potential towards profit maximization is attained (Mueni, 2018).

According to Stemberg & Lubart (1983) those institutions which operate under extreme environment with strict regulations are more likely to be innovative and come up with practices and products that maximize profitability in such environments. The words of Silber were contradicted by Tufano (1989) when he argued out that even though Silber's idea had some truth in them, they don't hold it for the security's financial aspect where the large institutions financial stability is the key determinant.

This theory forms the basis under which tier one commercial banks in Kenya should operate when developing their technological policy ensuring they increase their competitive advantage in the market. The theory offers the possible ways through which an organization conclusively manages to incorporate their ambitions in an environment government by rules and regulations operating against their mission and ensure that profit is maximized at the end of the day.

2.1.5 Circumvention Innovation theory

The theory was put forward by Kane (1987) when he postulated that the government in most instances establishes controls and regulations in the commercial banking sector which can exist in the form of property taxation. (Kane, 1987) held it that these controls and regulations could heavily derail the objective of the financial institutions of profit maximization.

Inspite of the negative effect of the controls and regulations, Kane (1987) believed that there was untapped potential that could arise from these controls as a result of those regulations which positively influences the process. To support his argument, Kane expounded how in the past decades in the USA evolution of financial innovation to counteract regulations has emerged. He outlined the impact of the federal government in deposing regulations to the financial sector and deduced that exogenous market forces like the dynamic technological change, uncertainty in the depositing environment could only be encountered by innovation.

The way necessity to come up with ways to overcome controls and regulations and increase financial institutional gains led to the birth of the Circumvent innovation theory (Kane, 1987).

This theory forms a strong Background for the financial sector as it elaborates what measures can be put into place when adopting technological practices in the country. A very good example the commercial banking sector could put this theory into practice on our country is the tussle for revenue allocation and generation in the country where corporate tax levels are exorbitant thus demotivating foreign investors in the commercial banking sector. If viable, the theory will be used as the drawing board under which the financial institutions can draw knowledge and information to counteract the corporate tax stalemate.

2.2 Empirical Review

Over the past decade, the commercial banking sector has witnessed unprecedented shift in the market share segment (Murthy & Mouritsen (2011). According to the CBK (2017) report, large banks or tier 1 banks grew their market share by 2.6% in the 2016/2017 financial year. The increase in market share was highly attributed to the increased customer's deposits and adoption of financial innovations (CBK, 2017). Players like Safaricom and other Finetech companies are competing with the commercial Banks but innovation seems promising to the resilience of the bank's performance.

Financial innovations are emerging and proving to be outstanding tools for commercial banks in withstanding local and global competition. The rapid changing and dynamic operational environment for financial institutions with both internal and external factors occurring in the form of capped interest rates, controlled, fragmented and dilapidated markets, changing customer habits and new technologies every now and then are some of the forces triggering banks to develop financial innovations in order to remain competitive while retaining and increasing their market dominance (Aduda & Kingoo, 2012). Ismail (2012) study on intellectual capital performance and board characteristics of banks conclusively deduced that

the performance of financial institutions was mainly driven by adoption of new ways of how to do their daily activities. He observed that there are several factors that either directly or indirectly are hindering innovation adoption in the banking sector in the low- and middle-income economies.

According to a report by the CBK (2017), the banking industry in Kenya has witnessed tremendous performance in terms of income generation over the past decade. Critics has it that the substantial growth in the financial sector is as a result of financial innovation adoption by the institutions. They were able to outline a glimpse of some of the adopted technologies in the banking sector ranging from the use of mobile phones as medium of transaction, the adoption of the electronic funds transfer technology to overcome the barriers of transferring money overseas, the offering of solutions to the clients remotely without physical interaction with the teller, the introduction of cashless shopping chips linked to the clients account and establishment of point of sale terminals where their clients can transact everywhere without accessing the financial institution amongst others.

Mohammed (2016) observed that even though the significance of the financial related developments in Kenya is being felt, there is still a far much to be done to ensure the impacts are felt. He attributes the misconstrued effect of the financial development to slow testing of the financial institutions performance and the insufficient discernment about the trailblazers in the financial sector.

The introduction and advancement of the ICT in Kenya is immensely contributing positively and at the same times with downfalls to the financial sector. Even though the positive side is outweighing the negative one, the need to really unravel the influence of innovations on the performance of commercial banks in Kenya. Currently, the biggest blow to these advances which have highly applauded has been the cyber insecurity which have seen the institutions and customer's loss huge chunks of money. This has left customers accusing the financial

institutions of adopting technology when they were not ready for it. The increased cyber insecurity issues have highly been attributed to the financial institutions who are very fast to adopt to the technology without due diligence on the critical issues associated with it and establishment of counter risk measures in advance (Thaller & Substein, 2003).

Wolff and Pett (2003) study noted that innovations positively contributes towards SMEs growth in US. Aduda and Kingoo (2012) concluded that the electronic banking is contributing positively to the performance of Kenyan banks. Empirical studies in Kenya have been done but with specific interest to a certain bank and cannot be generalized for the country in general as outlined by Frame and White (2008). This calls for an in-depth study which exposes the gigantic influence financial innovations has on the commercial bank's activities.

2.2.1 Mobile Banking and Financial Performance

According to Tiwari & Bus (2007), mobile banking is understood as to the provision of banking services with the help of mobile phones. According to (Njenga, 2008) the history of M-banking in Kenya dates back to 2008 in Kenya through a fostered competition between the telecommunication industry. This was highly accelerated by the competition between Safaricom their M-pesa Services and their competitor Airtel (Formerly Zain) with its Airtel money services. The nature of the M-banking services entailed customers depositing their money into their accounts and transferring to other users. Not only the transfer of money from one use to the other also payment of transactions (Souranta &Matilla, 2004).

Innovation in the mobile money banking has been witnessed with the possibility of internet banking whereby there has been advancement of the M-banking with the dawn of connected world. The mode of banking has gone beyond the country boarders and the leading player Safaricom remains uncompetitive in the same field everyday due to its innovativeness and creativity.

In the pursuit for competitiveness in the financial sector, one competitive edge was the adoption of the M-banking services proved to be a game changer. This was accelerated by its desire to prove that it could unlock the jargon which the banking sector had put forth to the poor societal class. There was a disconnect between the Banking industry and the rural poor who for a long time the banking sector had neglected due to its bureaucratic procedures and limited amount to own a bank account. Coupled with the distance and the scattered nature of the institutions this had created inequality (Sharma *et al*, 2015).

The term e-banking and M-banking have been used interchangeably though they have different meanings. E-banking takes place through a Personal computer or an electronic gadget which is linked to the internet while the mobile banking is via SMS. In the past decade, M-banking has witnessed tremendous growth with banks registering 2-3 times growth in their portfolio of the debit and credit accounts Ritvik Dubey (2009). This has led to many banks to advocate for the use of M-banking to its customers which is offering diverse benefits to them (Sharma *et al* 2015, Al-Somali *et al* 2009).

Michael and Mayer (2011) asserts that the use of mobile in undertaking banking transactions has existed for a long time. Despite this, the adoption of mobile phone-based banking has picked in the recent years where the people who never had mobile phones or knew how to use them came to utilize them for banking. Coetzee, Kamau and Njema (2013) postulated that use of mobile phones in carrying out banking transactions by the population or offering services through mobile phones has mainly happened through m-banking. This kind of banking has been adopted across all nations as it is easily accessible by majority of the population. This is because someone just needs network to access the services which also makes it cheaper as the customer does not have to spend money to visit the branches. Mobile banking is also more secure than other forms of banking. For example, in retail banking one can be robbed of the money as they leave the branch but mobile banking enables one to carry

their monies in their phones (Coetzee et al,2013). Banking through mobile phones has also been supported due to accessibility by rural population which creates economic growth among the population.

Despite the benefits of transacting through mobile phones, the use of mobile phones as a tool for banking has created a paradox across the globe (Jensen, 2007). It has been a basic item for consumers as technology advances from traditional to modern banking. Mobile phones are used as a tool of communication but has come to be used as a source of information through SMSs (Aker, 2010). The usage of mobile phones has been based on the reduction in communications costs which has made it easy for firm and government to pass information to consumers cheaply which has led to efficiency in agricultural and market activities. The consumers complaints have been handled through mobile phones which has increased firm efficiency and improved their performance (Aker, 2008). In the recent past mobile phones have been used as an innovative tool used to pass information on services and enable people to transact at the comfort of their homes, offices and other areas (Klonner & Nolen, 2008).

Baptista and Oleivera (2016) observed that various studies on m-banking have been conducted globally and majority focusses on adoption of the technology. Other studies have focused on the factors driving the adoption, their benefits and the behaviour of the customers. Hoehle and Huff (2012) outlines the impact of the M-banking technological innovation to the banking industry. They allude that the technology offers cross-field benefits which entails cross-selling and upselling the complex banking products and services. They also found that the m-banking platform is immensely contributing towards the banks improved operational efficiency, customer satisfaction and operational cost reduction.

The existing literature, the adoption of m-banking by financial institutions is highly and being driven by the perceived usefulness of the technology (Hanafizadeha *et al*., 2014), perceived ease of use (Hanafizadeha *et al*., 2014), trust (Hanafizadeha et al., 2014), social

influence (Aboelmaged & Gebba, 2013) Manzoor (2012) less attention has been channelled towards the performance of M-banking as compared to adoption. This is one of the driving forces behind this study. Individual banking performance in the past decade in Kenya has grown at unprecedented pace despite the economic hard times which have been witnessed in the industry.

CBK (2017), mobile banking in Kenya has positively influenced the performance of the financial institutions. Those institutions which have been able to launch the mobile banking have seen tremendous growth in their profits from the use of mobile phones to transact. The effect has been rippling with the economy growing at a higher pace with the mobile phones in the business sector acting as the medium of exchange enabling the business sector deposit portfolio to grow.

Aker and Mbiti (2010) researched on mobile phone usage in banking and how it affected the economic status of counties in sub Saharan Africa. They came to find that the usage of mobile phones in Africa enables firms to sell their services to a larger population at a low cost. The pricing of services and products sold through mobile phones were found to be cheaper with firms adopting the technology to cut on costs and increase coverage. The findings showed a strong effect of mobile phone coverage and the performance of firms. Increase in usage of mobile phones also increased the competitiveness of firms due to increased variety in services and reduced costs. This in turn improved the financial performance of the firms.

In Bangladesh, Rayhan et al (2012) studied the extent of use of mobile phones in carrying out banking transactions. They established that use of mobile phones in the banking sector enabled the banks to extend low priced services to users who had not transacted using their phones. The banks are also able to provide a variety of services to the mobile users while incurring reduced costs. Transacting through mobile phones enables people to save more as they can transact any time anywhere and at a low cost. This in turn increase the level of money

deposited in the banks while at the same time increasing the number of transactions. Mobile phones also perform advanced transactions where payments are made from the phone. This in turn enhance the financial performance of the banks while at the same time reducing the costs of transaction for the customers. The ability of mobile phones to use networks in deep rural areas creates it the most effective and efficient channel in banking.

Sewing (2014) studied one fifty-nine SMEs in China. He based his research on innovative strategies and their impact on the firm performance based on return on investment. The research was done based on 5 years of 2009-2013. Sewing used a cross-sectional research method based on both primary and secondary data. The relationship was investigated based on a panelised king of regression. The number of mobile transactions measured the innovative aspect of the study while the performance aspect was based on return on investment. He found a positive effect of number of mobile transactions on return on investment. However, the effect shown by the regression coefficients was insignificant. This shows that mobile banking innovation has an insignificant effect on financial performance of SMEs in China. The researcher based his study on SMEs while the current study used commercial banks as the target population. The study used a different period (2009-2013) compared to the current study (2013-2018).

A linear regression analysis on telephone banking and profits of 210 banks in Nigeria was done by Ofoegbu (2010). The research was done for 8 years of 2000-2008 using secondary data. A sample of 83 was randomly selected. Analysis by Ofoegbu showed a decline in profits after the banks adopted mobile phones as an innovative tool for banking. This was shown by increased level of non-performing loans attached to the mobile banking channel. This in turn reduced financial performance levels as shown by reduced return on assets. This study focused on all banks in Nigeria while the current study focused on tier one banks in Kenya. The study used non-performing loans as a measure of financial performance while the current study used

return on assets as the measure of financial performance. The study was based on the period between 2000 and 2008 while the current study was based on the period between 2013 and 2018.

Gakure and Ngumi (2013) did a descriptive evaluation on profits of forty-eight insurance firms and how it relates to innovative practices in Kenya. The research utilized secondary and primary sources of data. Data was descriptively and qualitatively analysed. Research showed a significantly statistical association between mobile phone usage and profits of the insurers. The study found that mobile banking has a positive effect on financial performance of insurance firms. The study used insurance firms as the target population while the current study used commercial banks as the target population.

Keru (2014) conducted a study on the effect of financial innovation on the financial performance of commercial banks in Kenya. This was based on Kenya Commercial Banks from 2007 to 2013. Mobile phone usage was investigated and related to the profits of the commercial bank group. He measured the financial innovation by the number of mobile phone transactions and financial performance by the profit margin. An effect was found on profits but was insignificant. The study used the period between 2007 and 2013 while the current study used the period between 2013 and 2018. The study also used all commercial banks while the current study used tier one commercial banks.

Momanyi (2015) conducted a study on the effect of innovations on the risk management of sixteen commercial banks in Nairobi County. Momanyi based the research on 5 years of 2009-2013. The study used the secondary data which was obtained from the websites of the companies. The research also applied a simple linear regression model in the study. Momanyi found that innovations like mobile phone transactions has exposed commercial banks to risks for example credit risks where customers end up defaulting on repayment of mobile loans. He found that mobile banking had a significant negative effect on the financial performance of the

commercial banks. The study used all the commercial banks while the current study used tier one banks.

2.2.2 Internet banking and financial Performance

As globalisation continues to shape the world of today, the era of wired continent continues to decline. The same trend is being observed in the banking industry with the advancement of information technology giving birth to internet banking. Currently internet banking is primarily being referred as e-banking. E-banking can be understood as a system whereby customers can remotely have the accesses to the banks website and being able to do all the transactions over the web without any assistance from the tellers. All the services are customised in such a way that they are web based (Punida & Sunsern, 2012).

ICT has proven to be a key factor in the performance of financial institutions. Internet has driven the banking industry to be a key contributor to the economic performance of countries globally. Internet usage in conducting business by banks has led to increased number of services and access to banking services. Internet has become cheap which has made a large number of people to use the internet in transacting business. It has also proven to be easy to use internet as a model for banking (Adesina & Ayo, 2010). Internet has led to the restructuring of business processes and financial structure in their urge to remain competitive (Loonam & O'Loughlin, 2008).

Banks, in the recent past, have accepted the use of internet in their business models. Banks have seen the potential that the internet has in reducing costs and increasing revenue through wide customer coverage (Chung & Dutta, 2012). The world has seen an increased level of internet usage recently. This has changed the customer preferences and lifestyles which has made the banks to include internet in their banking models in the urge to remain competitive and avoid financial woes. The banks have experienced reduced costs and increased profits through the adoption of internet driven form of banking model. The internet has also led to

increased growth in the global banking sector as more banks adopt internet banking with the ones left behind closing business. The consumers have also enjoyed secure business transactions across the internet as banks improve their security systems. Adoption of internet in banking has led to improved trends in business: transactional, sales and turnover.

According to Frust *et al* (2002), all the financial institutions in England despite their size that gad adopted e-banking were found to be making overwhelming profits and were really having less expenditures as compared to those institutions that had not. He concluded that e-banking had a positive impact on the performance of commercial banks. In the U.S, a study that was carried out by De Young et al. (2015) to establish the effect of the internet banking on the banking community found out that the e-banking was positively influencing the banking community. They realised that the banking communities' profits were growing at a high rate as a result of e-banking ensuring after movement of deposits and business transactions.

According to Ogare (2013) in his study to determine the influence of e-banking in Kenya, he found that there was positive correlation between the use of e-banking alternatives and the financial performance of the commercial banks. He found out those banks that had adopted e-banking their profit before tax had grown higher than those that had not adopted. This study used all commercial banks while the current study used tier one banks. Similar findings were put forward by Ali and Bichanga (2014) when they alluded that those commercial banks that had adopted e-banking had a stronger market share than their counterparts. This study also concluded that internet banking had a positive effect on the financial performance of commercial banks.

Kagan et al (2016) did a descriptive evaluation on internet banking and how it impacts on the performance of sixty American banks. Panel analysis from 2005-2015 was done on sixty European union banks. Financial statements of the specific community banks provided the secondary data for analysis. Inferential statistics were used for analysing the data. The study

found that banks that offered a wide range of banking services over the internet performed better than those without. They also discovered that banking over the internet helped the community banks in enhancing their ability to earn as indicated by a higher return on equity. Also, their asset quality was enhanced as it reduced the ratio of unsettled assets that were not performing. The study used panel data analysis methodology similar to the current study. This study was based on the period between 2005 and 2015 while the current study was based on the period between 2013 and 2018. The study was done on European banks while the current was done on Kenyan banks.

De Young et al, (2015) studied the effect of internet on output and performance at community banks in Oslo, Norway. The study used the descriptive research design to conduct a survey of 29 banks in the years 2006 to 2010. The variables included use of online accounts, debit and credit facilities. The study used online questionnaires to collect data. Central bank annual reports were used as the source of bank's data. The study found that in comparison to internet banks, the traditional community banks registered lower profits (insignificant) owing to lower business volumes (in terms of deposits and noninterest income) and they also incurred high costs of labour. Nevertheless, the author is also quick to point out that the financial performance improved with the adoption of internet banking. The study used community banks in Norway while the current used commercial banks in Kenya. The study was done on a period between 2006 and 2010 while the current was done on period between 2013 and 2018.

A panel analysis by Shirley and Sushanta (2016) on sixty-eight banking institutions in the united states of America was done. The main focus was on innovative products and how they related to profitability over twenty years. The results displayed that despite reducing costs, network issues lowered the profitability. It was concluded that internet relates negatively with the financial performance of banks in the USA. The study used panel data analysis similar to the current study. The study used banks in American while the current used Kenyan banks.

In Turkey, Onay, Ozsoz and Helvacıoğlu (2018) studied internet usage in transacting across banks and the profits of fourteen banks. Panel analysis was done on the data from 1996 to 2015. Financial performance was measured based on return on equity, invested capital, investment and equity. It was established that internet usage in banking increased return on assets and equity after one year. However, internet adoption in banking led to increased ROI and ROIC after two years of usage. The study used ROI as the measure of financial performance while the current used ROA as measure of financial performance. The study was based on Turkish banks while the current study was based on Kenyan banks.

Between 1995 and 2004, Arnaboldi and Claeys (2008) compared banks models based on internet adoption and firm performance. This was done on UK's, Spanish, Finnish and Italian banks. Longitudinal design was used based on secondary data. Comparative analysis was done and tabular presentation done. The results showed that banking institutions that had adopted usage of internet in their banking activities had better financial outcomes (ROA and ROE). The banking institutions were also found to incurred lower costs in their operations despite the low extra income. The effect was controlled by firm size inflation rate, and interest rate. The results found the coefficient of internet and bank deposits was insignificant. The preference is on value addition on bank products other than the range of products. Despite the positive relation between internet usage and firm performance, the customers still preferred visiting the retail shops which called for improved internet efficiency for maximum profitability. It was also established that use of internet in banking is affected by macro factors which may positively or negatively influence internet banking performance. The study used ROA as a measure of financial performance similar to the current study.

An analysis of innovative and traditional banking in Italy done by Hasan et al (2010) was done based on descriptive research mythology. The usage of internet in banking was found to have a positive impact on banking institution performance based on return on assets and

equity. Traditional banks performed poorly compared to the internet banks. This was reflected in the 27.3% average ROA of internet banks compared to 4.5% of traditional banks. The study used ROA same as the current study. The study, however, was done on Italian banks while the current was done on Kenyan banks.

In Spain, Hernando and Nieto (2016) did a panel data analysis on 32 banks between 2011 and 2015. The looked forward to establishing how web-based banking would change the performance of the banks financially. The findings were based on secondary data from financial statements of the banking institutions. They established that the usage of internet in transacting by banks led to the reduction in overhead costs. The reduction in the costs led to increased return on assets in a lag of one year. Increase in return on equity was felt in a lag of three years. Community banks performance and how it relates the level of adoption in terms of internet was investigated in UK (Ram et al, 2018). A sampling of 13 community banks was done randomly. Number of transactions through internet banking was correlated against return on assets. It was established that the use of internet as a form of banking enhance the performance through increases return on assets. Spanish banks were used while the current used Kenyan banks. The period of the study (2011-2015) differed with that of the current study (2013-2018).

Daneshvar and Ramesh (2012) studied IT and how it relates to firm value and profitability. The research was done on Indian banks from 1998 to 2009. The data was regressed and correlated to show the relationship. Tabular presentation of data was done. From the correlation, adoption of internet in banking led to increased level of deposits in Indian banks. From regression, a positive effect was established between internet adoption and profitability of the Indian banks. Employee turnover increased after internet adoption. This reduced operational costs and level of non-performing assets. Majority of the firms adopted internet in their attempt to reduce costs and improve their financial performance.

Ram, et. al (2018) investigated i-banking and how it affects banks' profits. A sampling of 13 community banks was done randomly. Number of transactions through internet banking was correlated against return on assets. The usage of internet supported the selling and advertising strategy of the banks. This led to reduction the selling costs which in turn led to introduction of low-priced products. This in turn increased the revenue and profits of the banks. Return on assets was used to measure financial performance similar to the current study. However, the study was based on community banks with the current based on tier one commercial banks.

Cheruiyot (2010) assessed the influence of innovations on financial performance of banks. The data was descriptively analysed to measure the internet variable using banking intensity as derived from a web feature data collected from 11 banks' websites between 2004-2009. The study used secondary data which was analysed using inferential statistics. Return on equity and return on assets were used as measures of the dependent variable. The results indicated that internet banking as an innovation had a positive impact on the financial performance of a bank to a little extent. The study used the period 2004 to 2009 while the current used 2013 to 2018.

Nyathira (2015) did a study on the effect of innovations on the profitability of commercial banks in Kenya between 2005 and 2013. 24 commercial banks were taken as the sample for the study. The research relied on the secondary data which was collected from the Nairobi Securities Exchange for the analysis. Data was based on a linear model to analyse the degree of the relationship between the innovation (mobile banking, agency banking and internet banking) and the financial performance. From the study findings, commercial banks which had adopted internet banking performed better financially. The study used profitability as the dependent variable while the current used financial performance as the dependent

variable. The study focused on period between 2005 and 2013 while the current focused on 2013 to 2018.

2.2.3 Agency Banking effect on financial Performance

The history behind agency banking dates to Brazil in 1999. The success of the practice and the lessons drawn from it have highly been adopted in the developed world especially in those countries which advocates for contracting of services. This business model was borrowed by developing nations commercial banking sector to promote their desire for inclusive financial systems and increased profit making (Atieno, 2001).

Atieno (2001) defines Agency banking as a scenario whereby the banking services are offered in a retail shop by the owner of the shop/business entity a contracted by the financial institution. Instead of having a bank teller at the ground, the owner of the retail business entity authorizes the customers to do banking operations like saving money, accounts balance check, depositing and cash withdrawals, payment of bills among others. Most of the banking agents in Kenya today are supermarkets, Chemists, M-pesa outlets, Chemists and wholesale shops. The respective bank has the mandate to train its agents on how to offer their services to their customers.

According to the CBK report (2017), the commercial bank agents in Kenya is growing at unprecedented rate. During The 2016-2017 financial year, the CBK reports that there was a 14% growth in the number of agents nationwide with the agents growing from 53,833 in 2016 to 61,290 in 2017. The continued growth is a clear indicator of the need for the agency banking as compared to the commercial banks which declined from 43 to 40 after collapsing of three commercial banks. Over the same financial period, the number of commercial bank branches nationwide witnessed 23% fall. The fall in the number of branch network and increased necessitates the essence of the agents (CBK, 2017).

The CBK report (2017) noted that there was a decline in the number of staffs in the commercial banking institutions which reduced to 30903 from 33,693 in 2016. The decline in the number of staffs was highly associated with the increased efficiency and performance of the agents. The decline has been attributed to the shift from the teller towards the agent business model which is proving to sustain the business.

Gardner and Cooperman (2000) pointed out that the agency banking was three times cheaper to run than the commercial banking system. The reduced operational cost of agency banking raises from the aspect that they utilize the existing retailing infrastructure thus lower running costs (Gardeva and Rhynea, 2011). Even though sometimes the variable cost which could run from the commissions to be paid to the retailers and the communication charges are far much lower as compared to the fixed operational costs of the branch banking. Kitaka (2001) outlined that the cost of establishing agent banking was 2-4% lower than that of the branch.

According to the CBK report (2017), from the increased agent banking the largest share of transaction was from deposits, followed by withdrawals and payment of services. The increased deposit portfolio indicates that the lower transaction costs of agency banking id attracting the low- and middle-income class who are the target customers. Not only the low transactional costs are increasing the portfolio, but it could also result from the proximity to the client which is reducing the time for the customer to access the financial institution as well as the increased inclusivity and service to the locals by the locals (Wainaina, 2011).

Gardner (2010) did a research on banking using agents. He asserts that involvement of agents in banking reduces operational costs. Agents lead to reduction in fixed costs through combination of all retail outlets where the bank needs not to invest in their own infrastructure. Retail banks show high variable costs compared to agents based on transactional cost. Hence, use of agents in banking reduces variable costs incurred by a banking institution. The study was based on retail banks only while the current was based on tier one banks.

Kitaka (2011) states that the establishment of agents by a bank costs four percent of the cost of paying a teller. he concluded that a teller costs the bank a higher fixed amount (78%) transaction compared to a small cost incurred through the agent (11%). The costs of acquiring an agent to extend banking services was found to be low. The customers also experienced reduced transaction costs when transacting through the internet compared to across the counter (70% less). Internet also reduces the bulkiness and costs related to handling paper work which enhances performance.

Kinyanjui (2011) in his study outlines one downside of the agency banking arising from the insecurity the agents face. Most of the agents are in remote areas where issues of insecurity are critical. This situation has resulted to holding of less money by the agents a scenario which limits the operations. This calls for new ideas on how the tier one commercial banks should overcome the riddle of insecurity to ensure that the agents reap as much as they can from the underserved target customers. Its therefore an awakening call to the government to ensure that security is beefed up in all areas to promote financial performance of agent banking thus increase service delivery to those areas which for long time feel that have been neglected by the commercial banks (Kinyanjui, 2011).

Involvement of agents in banking creates chances for banks to enhance financial performance through reduced costs (Kasekende, 2018). The coverage of agency banking is also large with the customers not requiring to visit the retail shops. The agents are also located in the remote areas which increases accessibility. In Africa, the agents have been important to banks as the population is sparsely distributed and have low literacy levels. Banks may find it very expensive to establish retail shops in the remote areas hence find agency banking a cheaper option (Kithaka, 2011). The agents also create flexibility to the bank as there is reduced need for investment in infrastructure. Karimi (2011) Identified the challenges the customers encounter when they approach the agents and found out that there was misunderstanding

between the agents and the clients. There is need to ensure that those who wish act as agents for any commercial bank are well trained on how to handle clients in order to ensure that there is satisfaction of the clients and thus attaining an increased market share and customer satisfaction.

Acharya (2011) did a study on the effect of financial innovation on the financial performance of microfinance institutions in India. The period of study was between 2001 and 2009. The study focused on 112 microfinance institutions in India, secondary data was used to analyse financial innovations and financial performance descriptive statistics was employed in the 20 analysis of the results. From the findings of the study, financial innovations through agents played a key role in the profitability of the microfinance institutions in India. The institutions which adopted the agency banking posted higher performance measures compared to the institutions which had not adopted agency banking. The study used microfinance institutions in India while the current study used tier one commercial banks in Kenya.

Kithuka (2012) endeavoured to establish the determining factors to usage of agents in Kenyan banking. Population was all Equity Bank agencies in operation between 2009 and 2011. The study used a descriptive design. The sample size was 100 Equity Bank agencies engaged in bank transactions in Kwale County. Quantitative and qualitative data were used. He found that agency banking provided the much-needed convenience to the users, it was easily accessible, was cost effective and secure and thus was more preferred and was rapidly expanding. The study was based on the period between 2009 and 2011 while the current was based on the period between 2013 and 2018.

Korir (2014) assessed the effect of financial innovative practices on the financial performance of Kenyan banks from 2004 to 2013. The study relied on both primary data and the secondary data for the sample of 11 commercial banks. Correlation analysis was done. It was established that innovation, agency banking, had a significantly positive effect on the

financial performance of the commercial banks. The study used all commercial banks between 2004 and 2013 while the current used tier one commercial banks between 2013 and 2018.

Waithanji (2012) outlined that there is a positive correlation between agency banking and the commercial banking performance. Though the study could not be determined due to low number of banks that had implemented it and that the impact may become clearer once all banks adopt agency banking. The study used all commercial banks while the current used tier one banks. This study will close the gap by determining the effect of the agency banking on the performance of the eight tier one banks in Kenya since 2012.

2.2.4 Self-Service Banking Technology Effect on Financial Performance

More and more enterprises are taking advantage of self-service technologies (SSTs) in their customer-related operating activities, especially service firms (Hung et al, 2012). Kaushik and Rahman (2015) defined self-service banking as the situation where a bank's customers arrange transactions by themselves, without involving bank staff. This include the use of ATMs, and Point of Sale. According to Wang (2007) on his study on the influence SST on the performance of the banking sector found out that highly driven by increased customer satisfaction rather than the profit maximization. This in return increased the market share which in turn increases the general financial performance of the bank.

In Singapore, a study by Neo (2010) in the hotel industry to determine its effect on the profit making on the restaurant found that those restaurants that had adopted the technology were more profitable than their non counterparts. This being a service industry like the banking one, there is a positive correlation to adoption of self-service banking in maximizing the profits as a measure of financial performance. The study used hotels as the target population while the current used commercial banks. The study was done in Singapore while the current was done in Kenya.

Nader (2011) did an analysis on the profitability of Saudi Arabian banks from 1998 to year 2007. The study adopted a descriptive research design to evaluate the impact of the adoption of financial innovations among the banks in Riyadh between 2005 and 2009. Primary data was collected using questionnaires while secondary data was gathered from the financial and annual reports of the banks It was established that usage of ATMs by the banks showed an increase in the financial performance ratios. However, POSs displayed an insignificant relationship with banks financial performance ratios. The study was based on Saudi Arabian banks from 1998 to year 2007 while the current was based on Kenyan banks between 2013 and 2014.

Agboola (2016) studied ICT adoption in Nigerian banking industry. It was found that banks experienced an increase in ATM points. The ATMs were found to increase level of income and the profitability of banks. The study was done on Nigerian banks while the current was done on Kenyan banks. Mabrouk and Mamoghli (2010) studied innovative banking and financial performance of banking institutions. ATM as an innovation was used among other variables as independent variable with return on investment used as dependent. It was established that ATM banking positively affected the return on investment as a measure of financial performance. The study was done on Pakistan banks while the current was done on Kenyan banks. The study used ROI as independent variable while the current used ROA.

Githakwa (2011) evaluated the degree to which ATM banking had been implemented by the commercial banks in Kenya. He adopted a descriptive research design to survey all the 44 commercial banks in Kenya in the years 2005-2010. The study used secondary data both qualitative and quantitively. Regression and correlation analysis were adopted. He discovered that since the introduction of mobile phone and agency banking, banks have progressively invested in such platforms and reduced dependence on ATMs in an effort to improve financial access to their clientele. The study established that self-service banking

(ATM banking) had a significant positive effect on financial performance of the banks. The study was done for the period between 2005 and 2010 while the current was done for the period between 2013 and 2018.

Wanjiku (2010) studied the impact of ATM banking on the financial performance of banks in Kenya. She used secondary data available in annual reports for the banks. Descriptive research design was adopted. The study used secondary data from risk manuals, financial products reports and financial reports of 18 banks which were representative of the 43 commercial banks in Kenya. The study used correlation analysis, regression analysis and autocorrelation techniques to analyse the data. The study discovered that throughout the years, banks have progressively invested in ATMs spread across the country in an effort to improve financial access to their clientele. The study also found that the number of transactions had gone up as a result of this expansion. This in turn improved the financial performance of the banks. The study was based on all commercial banks while the current used tier one banks. The study used correlation analysis while the current used panel data analysis regression model in its analysis.

According to Ongori (2013) in a study on self-service technology and customer satisfaction in commercial banks in Kenya Ongori pointed out that there were increased transactions from the banks that has set many ATM point to ensure that customers could serve themselves. The self-service banking technology allures customers to draw much than they had planned and even spent more than budgeted which has a positive effect on the bank's financial performance. The study was done on customer satisfaction while the current was done on financial performance.

2.4 Conceptual Framework

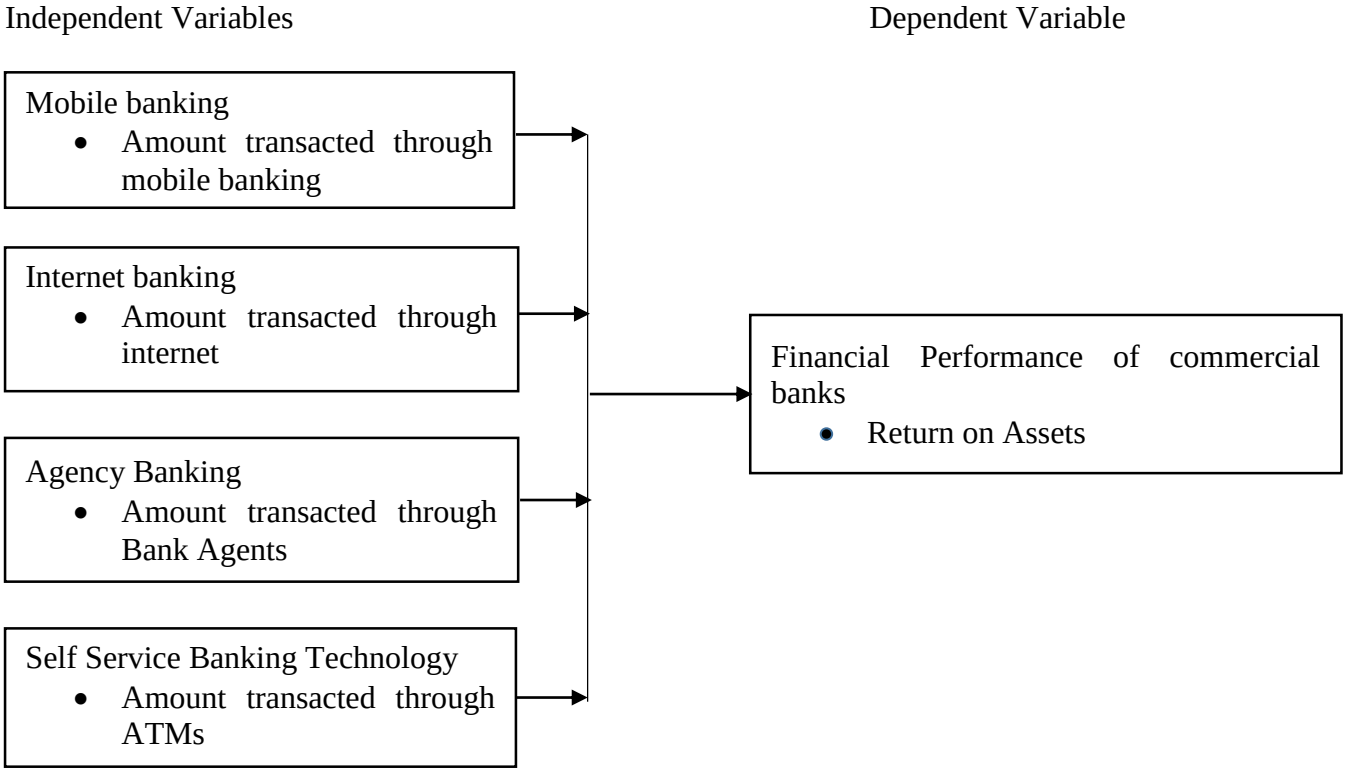

Figure 2.1: Conceptual Framework

Source: (Katutu , 2019)

2.5 Operationalization of Variables

Table 2.1: Operationalization of research variables

Variable		Indicator	Measurement
Independent Variable	Mobile banking	Amounts transacted through mobile banking	Log of amounts transacted through mobile banking
	Internet banking	Amounts transacted through internet	Log of amounts transacted through internet
	Agency Banking	Amounts transacted through bank agents	Log of amounts transacted through bank agents
	Self Service Banking	Amounts transacted through ATMs	Log of amounts transacted through ATMS
Dependent Variable	Financial performance of commercial banks	Return on Assets	Net profit/Total assets

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter offers an intensive discussion on the materials and methods that was used to collect and analyse data on the effect of the financial innovation on the performance of commercial banks in Kenya. The discussion covered the research design, the area under study, the target population, sample size determination, data collection and data analysis.

3.2 Research Design

Kothari et al.., (2010), defines research design as an organized process through which the problem at hand or under study is solved by careful planning, organization, collection and analysing of the available data into synthesized useful information. The research employed a descriptive research design. Maina (2016) argued that a descriptive research design is useful in the descriptive process for the phenomenon under observation.

Kothari et. al., (2010) further adds that elaborative research design provides a description of situations in their natural phenomenon. Descriptive research design was considered suitable in this study since it helped in assessing the impact of financial innovation on the performance of commercial banks, and how the chosen innovations impacts the profitability of banking institutions and answering the respective research questions to the study.

3.3 Target Population

Mugenda (2003) defines a population as the totality if all the observable elements to be studied and to which generalization of the results of the study can be drawn. It's a true representative of the elements under observation to answer the research question. At any moment in a study, population could be people, events, objects, households, firms, services, or other items of

interest. The target population for this study comprised all the 8 tier 1 commercial banks in Kenya (CBK, 2018).

3.4 Sample Size and Sampling technique

According to Saunders, Lewis, and Thornhill (2012) Sample selection from a defined target population requires the researcher to construct an accurate sampling frame which ensures that the right population for investigation is target. A census of all the 8 tier 1 commercial banks in Kenya was used in this study. Kothari (2004) defines census sampling as the process studying every unit, everyone or everything in a population, also known as complete enumeration.

3.5 Data Collection

Data collection in this study was done primarily using Secondary Data collection methods. This study collected the data from the secondary sources as outlined by Kothari (2004), secondary data is that data which have already been collected and analysed by someone else. In this case, the data collection sheet was used where records of data collected were keyed in before they were subjected to the analysis toolkit. Data was collected from the Central Bank of Kenya's annual supervision reports, published reports and other documents such as banking industry publication for the periods 2011 and 2018 on the counts and volumes of the alternate channels of banking transactions.

3.6 Data Analysis

Data was analysed using descriptive statistics, correlation analysis and panel data regression analysis with the help of STATA 13. Panel data regression model was specified as follows:

$Yit=\alpha +\beta 1MBit+ \beta 2IBit+ \beta 3ABit+ \beta 4SSBit + \varepsilon it$

Yit= Financial Performance as measured by ROA

α = Constant

MBit = Mobile banking

IBit = Internet banking

ABit = Agency Banking

SSBit = Self-service banking

B_i's= the beta coefficients of the independent variables

εit = Error term that capturing all relevant variables that were not included in the model

3.7 Diagnostic Tests

In order to ensure there is homogeneity in the results, the data was subjected to diagnostic tests to determine whether the laid assumptions were satisfied or violated. The following diagnostic tests were done.

3.7.1 Normality test

It was assumed that data should be normally distributed in a linear regression. The error term showed the factors that should be considered in the study but had been assumed by the researcher in developing the model. In OLS there has to be a normal distribution of the error. Shapiro-Wilk test was used in establishing the normality of data.

3.7.2 Multi-collinearity

Multi-collinearity is usually a common problem where the researcher uses time series data. The variables increase or decrease over time. Multi-collinearity makes the coefficient of regression

to be indeterminate. Multi-collinearity also made the standard errors to be infinite. To check for the presence of multi-collinearity, variance inflation factors (VIF) test was used. VIF values below 10 were translated to no worries regarding multi-collinearity problems while VIF values above 10 detected problems regarding multi-collinearity and which needed to be resolved.

3.7.3 Heteroscedasticity

Heteroscedasticity test was used to test whether the error term is the same across the observations. Breusch-Pagan was used to establish whether the variation amongst sampling units of a variable is continuous in a regression model. The condition can be corrected by applying corrected standard errors. Hypothesis is that the error terms are normally distributed.

3.7.4 Houseman Test

The Hausman Test was done for the model. The Hausman Test (also called the Hausman specification test) detects endogenous regressors (predictor variables) in a regression model. Durbin-Wu Hausman test was done to check for endogeneity in the data.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results obtained from the data analysis. The analysis was guided by the four objectives and the findings are presented in the tables below. Data analysis was done in the chapter. The data was subjected to Stata version 13 and Logistic linear regression model was determined to establish the association between financial innovation and the performance of the selected commercial banks. The following abbreviations as used in the data analysis and will be common in the whole chapter were used respectively. ROA= Return on Assets, MB= Mobile Banking, IB= Interne Banking, AB=Agency Banking, SSB=Self-service Banking.

4.2 Descriptive Statistics

From the descriptive statistics, return on assets displays a mean of 4.84% with a standard deviation of 1.414% between 2013 and 2018. The minimum return on assets for the period was 2.81 with a maximum of 8.44. Mobile banking showed a mean of 140.256 billion shillings between 2013 and 2018. In the period, the Tier 1 commercial banks in Kenya showed a minimum amount of 44.52 billion shillings transacted through mobile banking. The banks had a value of 298.03 billion shillings as the maximum amount transacted through mobile banking between 2013 and 2018. The amount of money transacted through mobile banking was found to vary so much across the period with a standard deviation of 58.17.

Further, internet banking across the tier 1 banks in Kenya showed a mean of 44.875 billion shillings for the period between 2013 and 2018. In the period, the banks showed a minimum amount of 18.19 million shillings transacted through internet banking with a maximum amount of 87.68 billion shillings. The amount of money transacted through internet banking was found to vary moderately across the period with a standard deviation of 16.017.

Between 2013 and 2018, the amount transacted through agency banking in Tier 1 banks averaged at 59.197 billion shillings. In the period, the banks showed a minimum amount of 0.23 million shillings transacted through agents and a maximum of 349.03 billion shillings within the same period. The amount of money transacted through agency banking was found to vary so much across the period with a standard deviation of 79.93.

Between 2013 and 2018, amount transacted through self-service banking in tier 1 banks showed a mean of 35.854 billion shillings. Internet banking showed a very high standard deviation showing that it varied moderately as shown by 12.169. During the period, self-service banking showed a maximum of 63.51 billion shillings and a minimum amount of 15.77 billion shillings.

Low standard deviation supports the mean. The standard deviation should the variation of the data from the mean. For example, ROA differed by 1.4% from the mean. This shows that the ROA did not differ much hence we can conclude comfortably that the mean ROA for tier 1 banks between 2013 and 2018 is 4.8%. On the other hand, agency banking shows a high standard deviation of 79.9. This shows that amount transacted through bank agents in tier 1 commercial banks in Kenya differed by 79.9 billion shillings from the mean of 59.19 billion. This means that the amount transacted through agents between 2013 and 2018 is more spread out compared to other variables.

Table 4.2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	42	4.838333	1.413634	2.81	8.44
MB	42	140.256	58.1702	44.52	298.03
IB	42	44.87452	16.01686	18.19	87.68
AB	42	59.19667	79.93224	.23	349.02
SSB	42	35.85429	12.16959	15.77	63.51

From figure 4.2, Kenya commercial bank showed a decreasing ROA from 2013 to 2018. The ROA decreased gradually from 2013 to 2015 before increasing through to 2016. The ROA fell

gradually from 2016 to 2017 before levelling in 2018. Generally, we can conclude that KCB experienced reduction in return on assets in the period between 2013 and 2014 but with fluctuations.

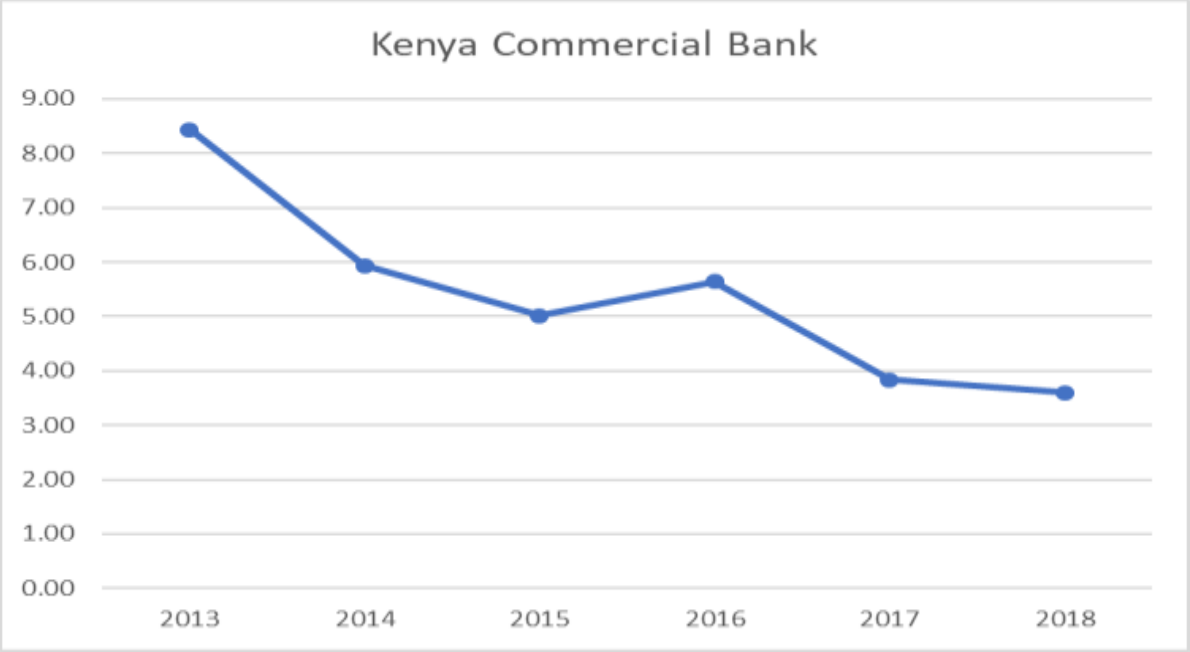

Figure 4.2: Movement of ROA in Kenya Commercial Bank

From figure 4.3, Equity Bank experienced a gradual decrease in return on assets from 2013 to 2014. This is shown by the negative gradient for ROA in the period. The return on assets for equity bank, decreased at a lower gradient from 2016 to 2018 compared to the period between 2013 and 2016. Hence we conclude that equity bank experienced reduction in return on assets from between 2013 and 2018.

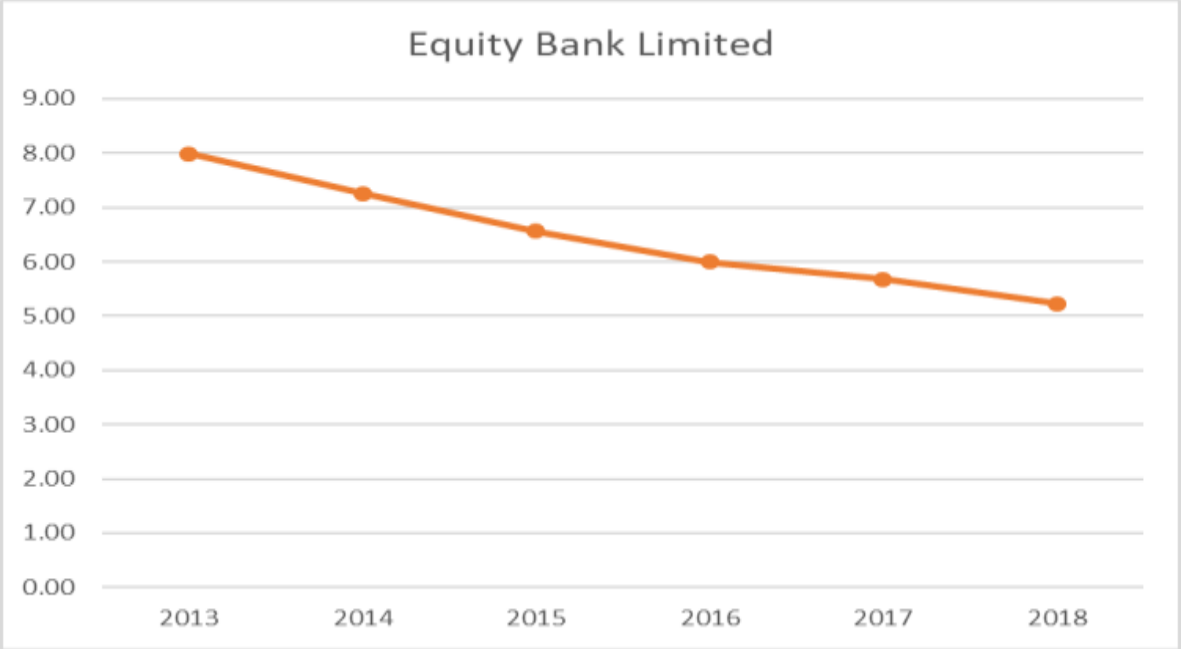

Figure 4.3: Movement of ROA in Equity Bank

From figure 4.4, co-operative Bank experienced gradual reduction of ROA between 2013 and 2014. From 2014 to 2015, the bank experienced marginal reduction in return on assets. However, return on assets rose marginally between 2015 to 2016 before falling gradually through to 2017. The bank experienced marginal increase in return on assets in 2017. We can conclude that despite the fluctuation in the return on assets in cooperative bank, return on assets fell from 2013 to 2018.

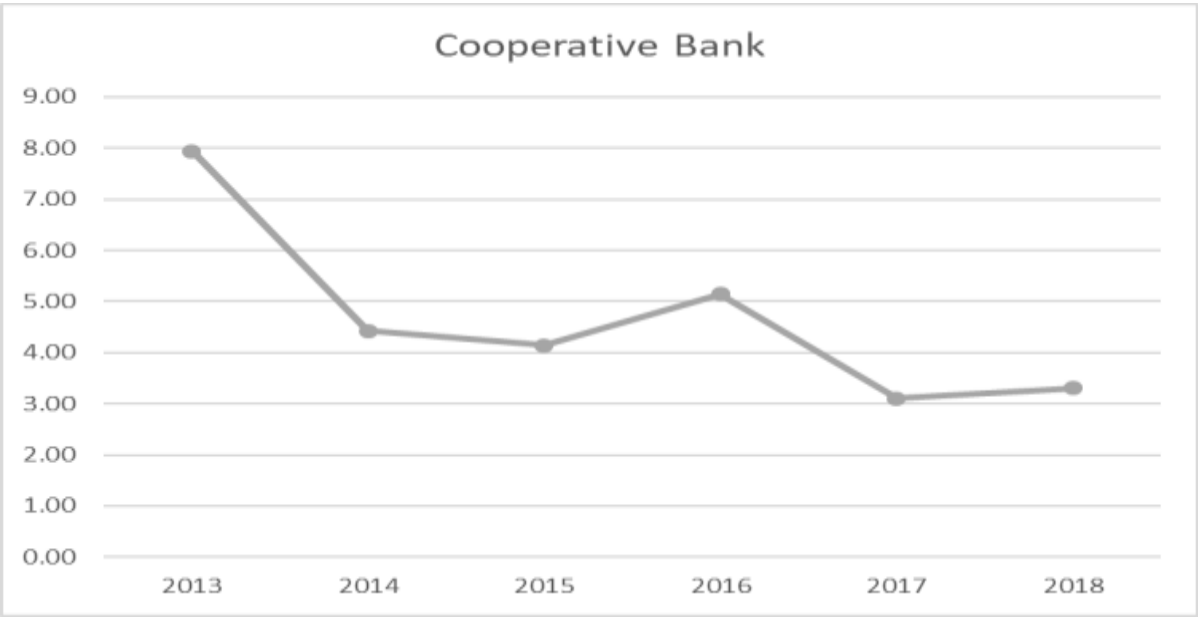

Figure 4.4: Movement of ROA in Co-operative Bank

From figure 4.5, Barclays bank experienced marginal increase in return on assets between 2013 and 2014. However, the bank experienced a marginal decrease in 2014 and gradual decrease in 2015. The gradient of the line decreased from 2016 showing a marginal decrease in return on assets between 2016 and 2018. From the figure we conclude that Barclays bank experience reduction in return on assets between 2013 and 2018.

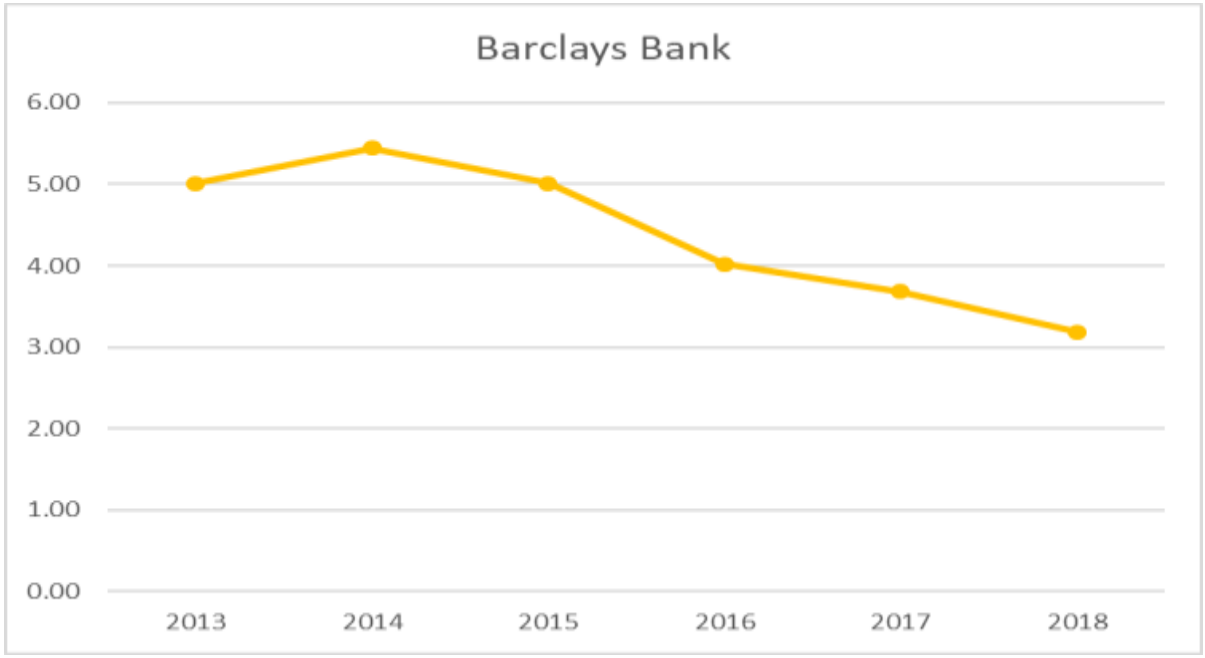

Figure 4.5: Movement of ROA in Barclays Bank

From figure 4.6, Standard Chartered Bank showed a gradual increase in return on assets between 2013 and 2014 before a sharp decrease to 2015. The bank experienced a sharp increase in return on assets between 2015 and 2016. However, there was a gradual decrease to 2017 before a marginal decrease to 2018. In general, standard chartered bank experienced a reduced return on assets from 2013 to 2018 despite the return on assets fluctuating within the period.

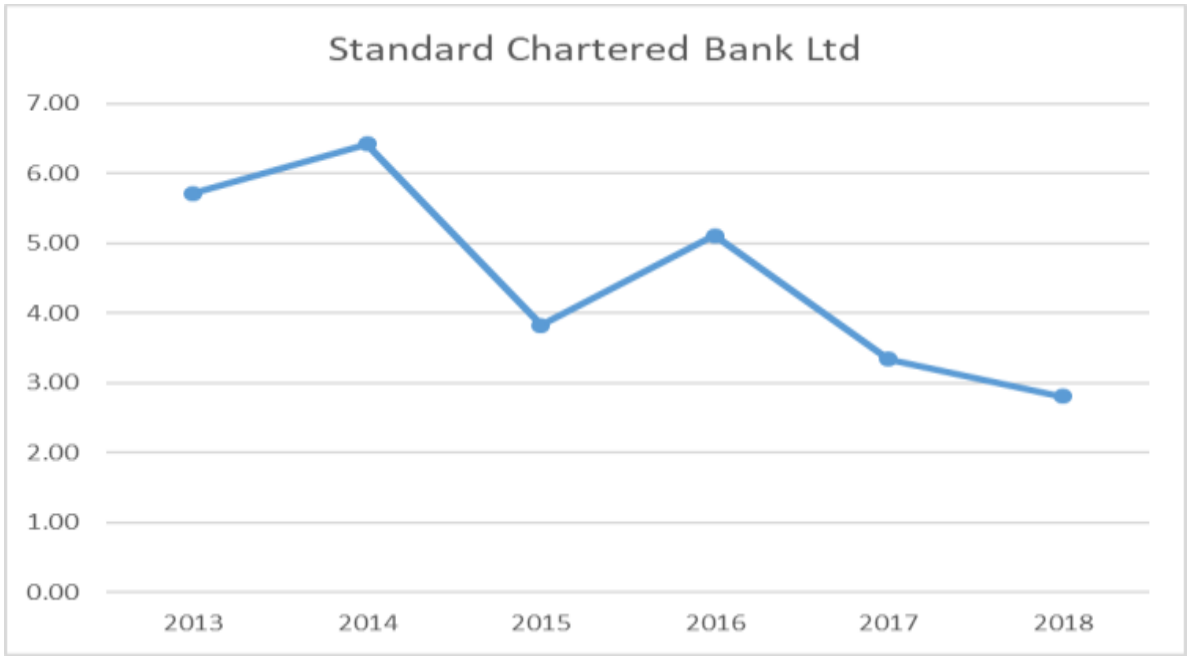

Figure 4.6: Movement of ROA in Standard Chartered Bank

From figure 4.7, CFC Stanbic Bank experienced increased return on assets between 013 and 2016. However, the bank experienced a gradual decrease in 2016 which turned marginal in 2017. We conclude that CFC Stanbic bank experienced a marginal decrease in return on assets between 2013 and 2018.

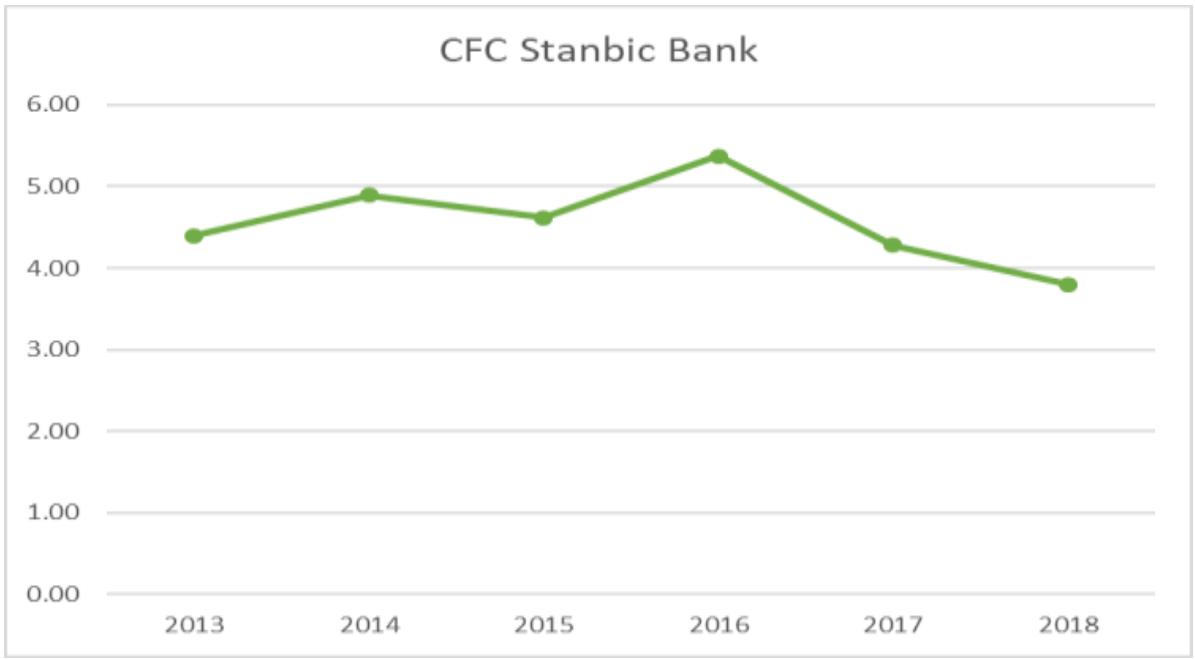

Figure 4.7: Movement of ROA in CFC Stanbic Bank

From 2013, Diamond Trust Bank Kenya experienced a gradual decrease in return on assets which flattened in 2015. The bank experienced gradual decrease in 2016 which marginalized in 2017. The bank, generally, experienced a gradual reduction in return on assets between 2013 and 2018.

Figure 4.8: Movement of ROA in Diamond Trust Bank Kenya

4.3 Diagnostic Tests

4.3.1 Tests of Normality

The study sought to test for normality of the data used in the research. This was done using Shapiro-Wilk test. The null hypothesis of this test was that the population is normally distributed. If the p-value is less than the chosen alpha level, then the null hypothesis is rejected and there is evidence that the data tested are not from a normally distributed population.

From table 4.3, return on assets and mobile banking displayed a p-value which is less than 0.05, hence the null hypothesis is rejected. This means that the data for the variables is not normally distributed. Internet banking, agency banking and self-service banking showed p-

values of more than 0.05. Hence, we fail to reject the null hypothesis and conclude that there is evidence that the data for the variables were normally distributed.

Table 4.3: Tests of Normality

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
ROA	42	0.94031	2.450	1.891	0.02930
MB	42	0.91984	3.290	2.514	0.00597
IB	42	0.97871	0.874	-0.285	0.61211
AB	42	0.98526	0.605	-1.060	0.85547
SSB	42	0.95776	1.734	1.161	0.12278

4.3.2 Multi-collinearity Test

This study also tested multi-collinearity of the data used in the research. Variance inflation factor (VIF) was used to carry this test and it quantifies the extent to which variance is inflated. From table 4.4, VIF values were close to 1 which is an indication that variance of the study variables had been inflated at a very low extent. The mean VIF is 1.22 (close to 1) hence there are no multi-collinearity issues in the model data.

Table 4.4: Multicollinearity Test

Variable	VIF	1/VIF
IB	1.34	0.746269
SSB	1.29	0.775194
AB	1.10	0.909091
MB	1.29	0.854701
Mean VIF	1.22	

4.3.3 Heteroscedasticity Test

From the findings the p-value is more than 0.05. Hence, we cannot reject the null hypothesis that there is constant variance in our data. Hence the data is free from heteroscedasticity.

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ROA

         chi2(1)      =     1.54
         Prob > chi2  =   0.2405
```

Figure 4.9: Heteroscedasticity

4.3.4 Hausman Test

To decide between fixed or random effects model, Hausman test was conducted where the null hypothesis was that the preferred model is random effects, that is if the Prob>chi2 value was greater than 0.05. The alternative the fixed effects if the Prob>chi2 value was less than 0.05. It basically tested whether the unique errors (ui) are correlated with the regressors. From figure 4.10, the p-value of Hausman test is smaller than 0.05 significant level. Therefore, the null hypothesis is rejected which suggest that fixed effect model is preferred.

```
. hausman fixed random

                ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference          S.E.
-------------+------------------------------------------------------------
          MB |   -.6178049      .062616       -.6804209        .2441971
          IB |   -7.355066     2.305487       -9.660553        2.360648
          AB |    1.224719     -5.96367        7.188389        1.748353
         SSB |    2.844963     4.760118       -1.915155               .
------------------------------------------------------------------------------
                           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(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       14.71
                Prob>chi2 =      0.0053
```

Figure 4.10: Hauseman Test for Fixed or Random Effects

4.4 Correlation analysis

From the correlation table, mobile banking displayed a positive relationship with return on assets as a measure of financial performance as shown by correlation coefficient of 0.8245. Internet banking showed a positive relationship with return on assets as shown by correlation coefficient of 0.7299.

On the other hand, agency banking had a positive relationship with return on assets as shown by correlation coefficient of 0.7498. Self-service banking showed a positive relationship with return on assets as shown by correlation coefficient of 0.6830. The p values were less than 0.05 showing significance in the relationships.

Table 4.5: Correlation Analysis

	ROA	MB	IB	AB	SSB
ROA	1.0000				
	42				
MB	0.8245	1.0000			
	0.0000				
	42	42			
IB	0.7299*	0.1071	1.0000		
	0.0000	0.4996			
	42	42	42		
AB	0.7498*	0.0925	0.2509	1.0000	
	0.0001	0.5601	0.1090		
	42	42	42	42	
SSB	0.6830*	0.2830	0.1123	0.0377	1.0000
	0.0000	0.1090	0.3291	0.7235	
	42	42	42	42	42

4.5 Regression Analysis

4.5.1 ANOVA and Model Summary

From figure 4.11, the model showed an F-statistic of 18.30 which is less than critical f value (2.69). The corr (u_i, Xb) of -0.8717 is close to 1 hence, a random effect model is not appropriate for the data. This shows that the fixed model fitted the data and was the best model to use in the regression. The model showed a significant value of 0.000 which was less than 0.05. This shows that mobile banking, internet banking, agency banking and self-service banking have a significant relationship with financial performance.

The fixed model is a within regressor model hence the interpretation is based on the R squared within the variables. The data showed an R squared value (within) of 0.7025. This shows that 70.25% of the variation on financial performance due to changes in mobile banking, internet banking, agency banking and self-service banking at 95% confidence interval. This

shows that 29.75% change in financial performance is accounted by other factors other than the ones considered in the study.

```
Fixed-effects (within) regression               Number of obs      =        42
Group variable: Number                          Number of groups   =         7

R-sq:  within  = 0.7025                         Obs per group: min =         6
       between = 0.5289                                        avg =       6.0
       overall = 0.6127                                        max =         6

                                                F(4,31)            =     18.30
corr(u_i, Xb)  = -0.8717                        Prob > F           =    0.0000
```

Figure 4.11: ANOVA and Model Summary

4.5.2 Regression coefficients

From table 4.6, the panel regression model was fitted as follows;

Y_{it}= 72.233 +0.618MB_{it}+ 0.355IB_{it}+ 0.225AB_{it}+ 0.845$SSB_{it.}$

It was revealed that holding mobile banking, internet banking, agency banking and self-service banking between 2013 and 2018 constant zero, financial performance of commercial banks would stand at 72.23. Unit rise in the value transacted through mobile banking would increase financial performance by 0.6178. A unit rise in internet banking would increase financial performance by 0.355 within the period.

On the other hand, a unit increase in value transacted through agency banking would lead to increase in financial performance by 0.225. The table shows that a unit increase in amount transacted through self-service banking would increase the financial performance by 0.845. The independent variables showed a significant relationship/effect on financial performance as the p values are less than 0.05.

Table 4.6: Regression coefficients

ROA	Coef.	Std. Err.	z	P>|z|
MB	.617805	.191939	3.22	0.001
IB	.355066	.008005	4.44	0.000
AB	.224719	.101923	2.20	0.014
SSB	.844963	.271633	3.11	0.001
_cons	72.232812	19.577812	3.69	0.000

4.6 Hypotheses Testing

H_{01}: Mobile banking has no significant effect on the financial performance

From table 4.7, mobile banking shows a positive z value of 3.22. This value is higher than the critical z of 1.645. This means that we reject the null hypothesis 'mobile banking has no significant effect on the financial performance of commercial banks in Kenya'. Hence, we conclude that mobile banking has a significant effect on financial performance of commercial banks in Kenya.

H_{02}: Internet banking has no significant effect on the financial performance

From table 4.7, internet banking showed a z value of 4.44. This value is higher than the critical z of 1.645. This means that we reject the null hypothesis 'internet banking has no significant effect on the financial performance of commercial banks in Kenya'. Given that the z value is positive, we conclude that internet banking has a significant positive effect on financial performance of commercial banks in Kenya.

H_{03}: Agency banking has no significant effect on the financial performance

From table 4.7, agency banking shows a positive z value of 2.20. This value is higher than the critical z of 1.645. This means that we reject the null hypothesis 'agency banking has no significant effect on the financial performance of commercial banks in Kenya'. Given that the z value is positive, we conclude that agency banking has a significant effect on financial performance of commercial banks in Kenya.

H_{04}: Self-service banking has no significant effect on the financial performance

From table 4.7, self-service banking showed a z value of 3.11. This value is higher than the critical z of 1.645. This means that we reject the null hypothesis 'self-service banking has no significant effect on the financial performance of commercial banks in Kenya'. Given that the z value is positive, we conclude that self-service banking has a significant positive effect on financial performance of commercial banks in Kenya.

Table 4.7: Hypothesis Testing

ROA	Coef.	Std. Err.	z
MB	.617805	.191939	3.22
IB	.355066	.008005	4.44
AB	.224719	.101923	2.20
SSB	.844963	.271633	3.11
_cons	72.232812	19.577812	3.69

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents and discusses the key data findings from the study, draws conclusion from the findings, and makes appropriate recommendations. The conclusions and recommendations drawn were focused on addressing the objectives of the study.

5.2 Summary of Findings

5.2.1 Mobile Banking and Financial performance

The amount transacted through mobile banking averaged at 140.25 million shillings with a high level of variation between 2013 and 2018. In the period, the Tier 1 commercial banks in Kenya showed a minimum amount of 44.52 transacted through mobile banking. From the regression analysis, mobile banking displayed a significant positive regression coefficient against financial performance. This means that increase in amount transacted through mobile banking would increase the financial performance of tier 1 commercial banks in Kenya. The findings concur with those of Sewing (2014); Rayhan et al (2012); and Gakure and Ngumi (2013) who established a positive significant effect. The findings differ with Ofoegbu (2010) and Momanyi (2015) who found a negative effect.

5.2.2 Internet Banking and Financial performance

In the period between 2013 and 2018, internet banking displayed a mean of 44.875 million shillings. This indicate that between 2013 and 2018, tier 1 banks in Kenya transacts approximately 44.875 million shillings per year through the internet. From the regression analysis, internet banking showed a significant positive regression coefficient against financial performance between 2013 and 2018. This means that increase in internet banking would cause an increase the financial performance of tier 1 banks. Internet banking showed a strong positive

relationship with ROA which was significant. This shows that internet banking relates positively with financial performance of tier 1 banks in Kenya. The findings concur with those of Ogare (2013), Kagan et al (2016) and Onay et al (2018) who found a significant positive effect. On the other hand, the findings differ with those of De Young et al, (2015) who found an insignificant negative effect and Shirley and Sushanta (2016) found a significant negative effect.

5.2.3 Agency Banking and Financial performance

Between 2013 and 2018, the amount transacted through bank agents in Tier 1 banks averaged at 59.197 million shillings. Customers in tier 1 commercial banks transact huge amounts of money through bank agents as shown by the maximum amount transacted of 349.03. From the regression analysis, agency banking displayed a significant positive regression coefficient against financial performance. This means that increase in amount transacted through bank agents increased the financial performance of tier 1 banks. The correlation coefficient showed that agency banking had a strong and significant positive effect on return of assets. This means that agency banking has a positive relationship with financial performance of tier 1 banks in Kenya. This concur with Acharya (2011); Korir (2014) and Waithanji (2012) who found a significant positive effect.

5.2.4 Self-service banking and financial performance

Self-service banking displayed a mean of 35.854 million shillings in the period between 2013 and 2018. This indicate that tier 1 banks in Kenya transacts approximately 35.854 million shillings per year between 2013 and 2018. From the regression analysis, self-service banking displayed a significant positive regression coefficient against financial performance. This means that increase in amount transacted through self-service banking would increase the financial performance of tier 1 banks. The correlation coefficient showed that self-service

banking had a strong and significant positive effect on return of assets. This means that self-service banking has a positive relationship with financial performance of tier 1 banks in Kenya. Agboola (2016) and Mabrouk and Mamoghli (2010) established similar results where a positive and significant effect was found.

5.3 Conclusions

From the strong r squared value, the study concludes that mobile banking, internet banking, agency banking and self-service banking are statistically significant determinants of the financial performance of tier 1 banks in Kenya. Mobile banking is the main determinants of financial performance of tier 1 banks in Kenya. The study further concludes that mobile banking significantly affects financial performance of tier 1 banks in Kenya. From the correlation analysis, mobile banking has a strong significant positive relationship with financial performance of tier 1 banks in Kenya. This shows that increased amount transacted through mobile phones improves the financial performance of commercial banks in Kenya.

The study concludes that internet banking has a significant effect on financial performance of tier 1 banks in Kenya. From the findings in the correlation analysis, the study concludes that internet banking has a strong positive relationship with financial performance of tier 1 banks in Kenya. Thus, increased amount transacted through internet improves the financial performance of commercial banks in Kenya.

The study concludes that agency banking has a significant effect on financial performance of tier 1 banks in Kenya. From the findings in the correlation analysis, the study concludes that agency banking has a strong positive relationship with financial performance of tier 1 banks in Kenya. Thus, increased amount transacted through bank agents improves the financial performance of commercial banks in Kenya.

The study concludes that self-service banking has a significant effect on financial performance of tier 1 banks in Kenya. From the findings in the correlation analysis, the study

concludes that self-service banking has a strong positive relationship with financial performance of tier 1 banks in Kenya. Thus, increased amount transacted through self-service like ATMs improves the financial performance of commercial banks in Kenya.

5.4 Recommendations of the Study

Since financial innovation is aggressively and continuously adopted in Kenya, the government should provide incentives for research and development to research scientists who would continue to invest their time and skills in discovering more financial innovations for the banking sector. Commercial banks should adopt the use of financial innovation to increase their financial performance.

Mobile phones and internet have been found to have a major influence in delivering innovative banking services. It is recommended that tier 1 commercial banks continue to create sustainable business linkages and collaborations with mobile phone service providers as well as internet service providers in order to enhance financial performance.

Based on the research findings the study recommends that commercial banks should continue investing in self-service banking services like ATMs as this was found to have positive influence on financial performance. It is also vital that financial institutions intensify on distribution of ATM machine in order to ensure better customer service. The study further recommends that banks recruit more agents offering banking services. This would increase the amount transacted which would in turn increase return on assets.

5.5. Limitations of the Study

The study was limited to the 6-year study period of 2013 to 2018. This means that the findings may differ where the analysis is done based on a longer period like 10 years. The study was limited by the inability of the researcher to assess the credibility of the data. This is despite the data having been sought from financial reports and the central bank of Kenya. The study was also limited to the financial innovations in banks.

5.6 Suggestions for Future study

Based on the findings the study recommends a study on other factors determining financial performance of tier 1 banks other than financial innovation as there is a 29.75% unexplained variation in financial performance. The study also recommends that a similar study to be done using a longer period.

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APPENDICES

Appendix I: List of Tier 1 Commercial Banks in Kenya

1. Kenya Commercial (KCB)
2. Equity Bank Limited
3. Co-op Bank
4. Barclays Bank
5. Standard Chartered Bank Ltd
6. CFC Stanbic Bank
7. Diamond Trust Bank Kenya
8. Commercial Bank of Africa

Appendix II: Data Collection Sheet

Year	Return on Assets	Amount transacted through Mobile banking	Amount transacted through Internet banking	Amount transacted through Agency banking	Amount transacted through Self-service banking
	%	Shs.	Shs.	shs.	shs.
2013					
2014					
2015					
2016					
2017					
2018					

Appendix III: Data

	Year	Return on Assets	Mobile banking	Internet banking	Agency banking	Self-service banking
		%	shs.	Shs.	Shs.	shs.
Kenya Commercial (KCB)	2013	8.44	142238514.76	58134918.00	4457989.00	55439200.00
	2014	5.93	177412562.99	64554704.00	18815320.00	50396748.00
	2015	5.01	210647021.30	68535139.00	43407208.00	52830728.00
	2016	5.64	250965209.11	73862909.00	78445474.00	61106522.00
	2017	3.84	272161493.67	79635293.00	134552330.00	62198014.00
	2018	3.60	298034860.37	87684445.41	169719142.00	63510634.00
Equity Bank Limited	2013	7.99	100978487.58	41271354.00	16360520.00	39357600.00
	2014	7.26	125949376.78	45828912.00	19299421.00	35777844.00
	2015	6.56	149543305.20	48654717.00	46799126.00	37505784.00

	2016	6.00	178166140.82	52437027.00	251660310.00	43380966.00
	2017	5.68	193213884.82	56534979.00	321278399.00	44155842.00
	2018	5.23	211582000.11	62249262.77	349019918.00	45087702.00
Co-op Bank	2013	7.94	93377956.25	38164908.00	34710872.00	36395200.00
	2014	4.43	116469316.16	42379424.00	44652812.00	33084888.00
	2015	4.14	138287357.49	44992534.00	51106465.00	34682768.00
	2016	5.15	164755786.13	48490154.00	61246172.00	40115732.00
	2017	3.10	178670904.24	52279658.00	91392016.00	40832284.00
	2018	3.30	195656473.22	57563834.39	105981512.00	41694004.00
Barclays Bank	2013	5.01	91206375.88	37277352.00	12726333.00	35548800.00
	2014	5.44	113760727.42	41393856.00	16649320.00	32315472.00
	2015	5.01	135071372.44	43946196.00	27553052.00	33876192.00

	2016	4.02	160924256.22	47362476.00	35622003.00	39182808.00
	2017	3.68	174515766.94	51063852.00	39709365.00	39882696.00
	2018	3.19	191106322.68	56225140.57	42037190.00	40724376.00
Standard Chartered Bank Ltd	2013	5.72	85777424.93	35058462.00	3949701.00	33432800.00
	2014	6.42	106989255.55	38929936.00	5638098.00	30391932.00
	2015	3.83	127031409.79	41330351.00	12705665.00	31859752.00
	2016	5.11	151345431.45	44543281.00	18221895.00	36850498.00
	2017	3.34	164127923.67	48024337.00	24446798.00	37508726.00
	2018	2.81	179730946.33	52878406.01	29018268.00	38300306.00
CFC Stanbic Bank	2013	4.40	61890040.77	25295346.00	25520173.00	24122400.00
	2014	4.89	77194779.32	28088688.00	44434046.00	21928356.00
	2015	4.62	91655574.15	29820633.00	55026925.00	22987416.00

	2016	5.37	109198602.44	32138823.00	78139918.00	26588334.00
	2017	4.28	118421413.28	34650471.00	81433411.00	27063258.00
	2018	3.80	129679290.39	38152773.96	85317826.00	27634398.00
Diamond Trust Bank Kenya	2013	5.28	44517397.75	18194898.00	226708.00	17351200.00
	2014	4.47	55526069.33	20204144.00	465690.00	15773028.00
	2015	3.69	65927693.69	21449929.00	895582.00	16534808.00
	2016	3.64	78546363.16	23117399.00	971821.00	19124942.00
	2017	3.05	85180314.81	24924023.00	1125622.00	19466554.00
	2018	2.90	93278086.07	27443223.37	1481541.00	19877374.00