THE EFFECT OF FINANCIAL TECHNOLOGY ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

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DECLARATION

This research paper is my original work that has not been presented for a degree in any other University, for any other award and where other people's research was used, they have been fully acknowledged.

Signature…… Date……..

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This proposal has been submitted for examination with our approval as university supervisors.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
ASIC	Australian Securities and Investments Commission
ATMs	Automated Teller Machines
CBK	Central Bank of Kenya
CCK	Communications Commission of Kenya
CMA	Capital Markets Authority of Kenya
E-banking	Internet Banking
ES	Efficiency Structure
FinTech	Financial Technology
ICT	Information Communication and Technology
IoT	Internet of Things
KCB	Kenya Commercial Bank Limited
M-banking	Mobile banking
NIM	Net Interest Margin
PEX	Palestine Securities Exchange
ROA	Return on Assets
ROE	Return on Equity

SMEs	Small Medium Enterprises
SMS	Short message services
SSA	Sub-Saharan Africa
TAM	Technology Acceptance Model
U.K.	United Kingdom

ABSTRACT

Numerous changes that have taken place in the Kenya banking sector necessitates each commercial bank to act diligently to increase its financial performance. One of the areas where commercial banks should capitalize is financial technology that looks at the innovations brought by technological advancement to bring throughput and enhance financial performance. This study aims to look at the effect of financial technology on financial performance of commercial banks in Kenya. The study was based on Technology acceptance model, diffusion innovation theory and resource based theory. Financial technology was determined by the number of transactions that were undertaken through mobile banking and transactions undertaken through internet banking. Data was, however, only found in 35 commercial banks that represented a response rate of over 80%. Size of the commercial bank and capital adequacy ratio acted as the control variables of the study. Secondary data was collected for all the commercial banks in Kenya for descriptive research design that was used in the study to summarize the data using SPSS 21. Pearson moment correlation was conducted to establish the linear relationship between study variables. Regression analysis was conducted to establish the nature of the relationship. The study concluded that a positive significant effect of financial technology on financial performance was observed while the model predicted 45.4% of the dependent variable. The study recommends that commercial banks should continue investing in financial technology.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The development of Information Communication technology (ICT) has led to improved ways of business in currently (Stiroh, 2001). Ongori and Migiro (2010) argue that Information along with communication technology has conveyed an absolute prototype change on the functioning of financial institutions along with the delivery customer services in the banking business. In an offer to draw level with the overall development, advance the delivery excellence of customer services, as well lessen transaction costs, financial institutions have ventured enormously in technology and have broadly employed Financial technology networks for the delivery of a broad variety of value added products as well as services. Financial technology acts as a catalyst for improved efficiency and also economy expansion at the firm's level (Hitt, 1996).

Several theories have given light towards technology. Technology acceptance Model was formulated by Davis (1989) and it affirms the connections amid of technology reception level with user aspects that consist of apparent convenience, professed easiness of use, attitude toward using, along with genuine usage behavior. Legris, Ingham and Collerette (2003) argued that they proved that Technology acceptance Model is a theoretical model that can help elucidate as well foretell customer conduct of Information Technology. Sabi (2014) explained Technology acceptance Model theory as the most relied and applied theory as evidenced by thirty one articles or sixteen percent out of the one hundred and eighty eight articles he reviewed. Innovation Diffusion Theory is another theory which was developed by Rogers (1995). (Fichman, 2000) describes diffusion as the practice by which a technology extends across companies. The diffusion perceptions of novelties

habitually refer to ideas' stretch from one culture to another or from an entity within the world to other parts world (Rogers, 1962).

Commercial banks just like most of other institutions continue to operate in an environment that requires them to adapt. Vaidya (2011) stated that the world is becoming so much captivated to performing trade across the internet along with World Wide Web. Internet commerce has extended in various inventive monetary forms, and founded on digital information provided by private business performers, has in one mode or another provided for goverment authoritative bank notes plus inspecting accounts as a routine means of payments (Cohen, 2001).

1.1.1 Financial Technology

Financial technology (FinTech) is portrayed as a new form of monetary service trade that merges IT with fiscal services similar to payments, remittances and also management of assets (Lee & Kim, 2015). FinTech can also be described as technology-enabled financial solutions that cover up the whole services' as well as products' range conventionally offered by banks (Arner, 2015). A monetary company is poised of firms that employ technology to build the economic structures more resourceful (McAuley, 2015)

FinTech is increasingly becoming an important part of the fabric financial services ecosystem and banks. Access to monetary services as well as products is growing to be more manageable than always, in particular for customers who reside in the rural areas with no forms of a present financial system. Not simply could financial technology build these commodities more available, it can as well construct them more inexpensive through the lessening of costs in conducting commerce for the bank, funds that could be

conveyed to the consumers. Couples this with the near omnipresent accessibility of inexpensive mobile cell phones as well as cellular networks, with a globe where no person is expelled from the economy could not be that far unlikely (Bames, 2014).

Bitler (2002) stated that financial technology is applied today to many financial transactions including Mobile banking which is a link amid a mobile cell phone with a staff or company bank account. Internet banking is providing financial services through a website operated by the bank. Peer to peer crediting is a way of loan funding that facilitates people to borrow as well loan funds with no exploit of a bureaucrat bank as a conciliator. Blockchain which is a digital ledger in which dealings prepared in crypto currencies are accounted for openly and also chronologically and other technology services including credit cards and ATM machines are used in financial transactions.

1.1.2 Financial Performance

Financial performance gauges are used to calculate efficiency as well as competence by which companies use their investments to generate value for shareholders. The most used and suggested gauges of economic performance scrutiny consist of productivity, liquidity along with solvency. The important rations used and usually recommended for profitability are Return on Assets (ROA), Return on Equity (ROE) and the operating profit margin in addition the net revenues (Zenios, 1999).

Financial performance of a firm can also be used to determine the financial position of a company in a specific time frame furthermore be utilized to comparatively evaluate identical companies in one business or to undertake comparisons across businesses or divisions. For profit companies, there are many approaches employed to determine a

firm's fiscal achievement. For example, revenue generated from income operations and also cash flows from operations are indicators of financial performance (Jayawardhera & Foley, 2000). Knowing that profit is the ultimate goal of firms, it can also be a measure of the company's financial performance. Return on asset is also another important ratio for measuring the productivity in the commercial banking sector.

Schiniotakis (2012) noted that ROA is deemed by practitioners and scholars as an important stability financial performance indicator for the financial institutions and the financial services division in general. ROE as a financial ratio in banks refers to the income a company earns in relation to the shareholder equity as reported on the balance sheet of such a bank. Schiniotakis (2012) noted that ROE also acts as a risk indicator for the bank's managers and shareholders.

1.1.3 Financial Technology and Financial Performance

Technology has significantly developed in acting a key task in advancing the service delivery standards and economic performance of in the financial institution sector. Customers can do financial transactions at their expediency by using their ATM cards or across the internet when they are at their residences. In addition, because of the incredible increase of the mobile cell phone business the majority banks have invested in the unexploited opportunities and have aligned with mobile cell phone network suppliers to provide banking services to their customers (Okiro, 2013). Financial technology have directed to revolutions in the mode the banking industry is done as establish by Yin and Zhengzheng (2010) who reveals facts that Chinese commercial banks have moved from the customary company operation approach; the extensive credit operations to the retail approach as a consequence of technological inventions**.**

Rose (1999) defined mobile banking, which is a notable technology innovation, as a service offered by banks in collaboration with mobile cell phone operatives. It permits clients having busy days to expediently perform their banking by use of their cell phones anytime. It is a propos catching banking services to the unbanked, habitually residing in the secluded regions. This reduces the transaction costs and increases the number of users and transactions which greatly impacts the bank's financial performance.

Hernando and Nieto (2007) investigated the impact of mobile banking with profitability achievement of Spanish business financial institutions. The research established that mobile banking attracted more customers and increased the customer deposit. The study concluded that mobile banking leads to a better financial performance.

Financial institutions are also now using Internet banking as an important array of enhancing economic benefits and delivering product and services to customers through a website. Ross Bainbridge (2006) argued that several banks and financial institutions run entirely via the Internet only and have no brick and mortal entities. By using internet banking, customers of banks can make payment of bills, payment requests cancellation, transfers from one client account to another, inquiries about the balance, repayments and loan applications.

A study which is conducted by Sayar and Wolfe (2007) investigated how Internet banking affected performance of banks comparing the situation in Turkey and United Kingdom. Even though the UK has a better environment for internet banking, the research concluded that more people in Turkey uses Mobile bank than in the United

Kingdom. The research results concluded that internet banking had a positive influence on the performance of financial institutions.

In India, Pooja and Singh (2009) end that internet banks were superior extra commercial, had advanced quality assets, lesser organizational costs and were extra proficient contrasted with the non-internet financial institutions. In Jordan, electronic banking led to additionally contented clients with improved long term expenditure reduction tactics (Siam, 2006).

1.1.4 Commercial Banks in Kenya

In Kenya, there are 25 local private commercial banks, 3 local public commercial banks and 15 foreign owned commercial banks (CBK, 2017). Three private commercial banks are now under statutory management as of 2017. CBK identified the three banks as Charterhouse Bank, Imperial Commercial Bank and Chase bank.

The effect of Fin Tech in the country begun to be prominent in 2016 after the Capital Markets Authority of Kenya and the Australian Securities and Investments Commission marked a collaboration conformity to sustain Fin Tech. Technology exploit has directed the enhanced utilization of workforce as well as the firm's assets, improved profits and also raised access to economic services by the public (Mwania & Muganda, 2011)

Central Bank of Kenya has been a forefront user of FinTech such as internet banking platform to promote its financial services and give customers an access to quality survives. This move by the Central Bank of Kenya has had a great impact on the products and services offered by Kenyan banks making them some of the globally acclaimed in adoption of financial technology (CBK Report, 2015)

1.2 Research Problem

FinTech is depicted as a new type financial service business that merges it with economic services like payments, remittances and asset management (Lee & Kim, 2015). FinTech which is an invention that tries to contend with conventional economic means in financial service delivery is not only restricted to expenditure lessening advantages alone but as well have significant contribution to extending access to clients living outside the subdivision network and build opportunities for effectual cross (San-Jose, Ituralde & Maseda, 2009).

The banking sector in Kenya has encountered unstable periods subsequent to the crumple of a lot of financial institutions in the 1990s. So as to reduce their operational expenditures, business financial institutions have accepted the banking technologies together with mobile banking, ATMs as well as internet banking where clients can use their accounts from their individual computers or mobile phones. To assist additional fiscal intensify, the CBK in 2010, permitted regulated business financial institutions to work via third party representatives, subject to agent allowance. In May 2012, the CBK permitted regulated deposit taking micro-finance banks to function not just via third party representatives, bar to manage organizations. Mobile phone network managers along with banks have reacted quickly to this new power to take on agency as well as mobile banking. M-money managers have also connected with business financial institutions like the Equity Bank, Kenya Commercial Bank, I&M Bank, Barclays and Co-operative banks to provide mobile founded financial services that seek to attain the unbanked.

Internet banking has also been creating a lot of values for commercial banks in Kenya and banks have recognized the importance of internet banking. Both customers and

financial institutions are embracing FinTech to improve the efficiency of their service delivery. All these financial technology forms are directed towards leveraging the operating expenditures of business financial institutions in Kenya (Muyoka, 2014).

Various studied have been done about the effects of FinTech on economic achievement of firms financially and operationally. Bitler (2001) made a research on the connection amid ICT investments with small company's achievement. The study found out the performance of firms using FinTech is better than the firms those do not use FinTech. Another study which is being conducted by Berger et al. (2003) investigated the technological development with its influences on the banking industry exploiting relevant facts. The study concluded that the investment in technology leads to reduction in costs.

A study conducted by Muyoka (2014) investigated the connection amid mobile banking on the economic attainment of business financial institutions in the Kenyan economy. Muyoka established that there is a considerable connection amid mobile banking with the effectiveness of business financial institutions in the country. Another examination made by Juma (2012) examined the effects of ICT acceptance on development of business financial institutions in Kenya. The research found out that there is an affirmative link amid Information and communication technology and development of business financial institutions. The commercial banks those invest more in technology have higher growth in market share.

From the above studies, there has been no attention paid on how FinTech, both Mobile and internet banking, affects return on assets in financial performance of commercial banks in Kenya. Therefore, this study seeks to fill this gap by finding the effect of

financial technology on the economic benefit of commercial banks in Kenya. In particular, the study will address the effect of Mobile and internet banking on the economic benefit of commercial banks in Kenya.

1.3 Research Objective

The general objective of this research is to investigate the effect of financial technology on the achievement of commercial banks in Kenya.

The specific objectives are to:

i. Assess the effects of Mobile banking on the financial performance of commercial banks in Kenya.
ii. Assess the effect of Internet banking on financial performance of commercial banks in Kenya

1.4 Value of Study

The findings of this research shall inform the advantages of using FinTech as a tool of enhancing efficiency and cost reduction. The findings might be used by CBK and other policy makers setting policies and regulations that promote the usage of financial technology in commercial banks of Kenya and improve their performance.

The study is also beneficial to the commercial banks of Kenya. They will be informed about the challenged faced by the commercial banks in adaptation of financial technology. This will motivate the institutions those still afraid of adopting the technology after finding out its benefits.

The theories and application in this research shall put in to the existing information body. The researchers who be interested to conduct a research in this area might exploit the outcomes of this research as a point of suggestion to further studies.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The section reviews past literature on financial technology and banking financial performance. Hypothetical basis directing the study is given. This chapter also outlines empirical studies on how technology influences the financial performance of banks. A conceptual model is illustrated which portrays the connection amid the independent and dependent variables and finally, a summary of the literature review is concluded.

2.2 Theoretical Review

In this part, we discuss the presumptions that hold the connection amid financial technology with financial achievement. These presumptions are acceptance model and diffusion of innovation theory.

2.2.1 Technology Acceptance Model

Technology acceptance Model which was developed by Davis (1989) proposes that the relationship between the user's acceptance to any innovative and the users' apparent ease of use and usefulness of such technology. The Technology acceptance theory suggests that there are several issues determine the decision about how and when the technology will be used. These issues include the apparent convenience and the perceived user-friendliness of a particular technology (Davis, 1989).

Legris, Ingham and Collerette (2003) argued that they proved that TAM is a theoretical model that can help clarify and envisage customer actions of IT. Sabi (2014) explained TAM theory as the most relied and applied theory as evidenced by thirty one articles or sixteen percent out of the one hundred and eighty eight articles he reviewed.

In this study, the theory is relevant because it is a factor by which the adaptation of FinTech by commercial banks can be rationalized. How the users react to the newly introduced technology is a key factor in its adaptation. In this study we shall conduct a research to find out the percentages of customers enrolled for online banking in Kenya. This determined the association between the usefulness of FinTech and the users' perceptions.

2.2.2 Innovation Diffusion Theory

This stipulation was introduced in 1962 and modified by Rogers (1995) and it aims on considering how, why and at what rate inventive thoughts as well as technologies extend in a collective organization (Rogers, 1962). (Fichman, 2000) explains diffusion as the means in which know-how stretches within the industry. The notion of innovation diffusion habitually relates to idea spread from one community to another or from an entity in the public to other regions of that community (Rogers, 1962).

In line with this theory, the decision to take up innovations is determined by five issues regarding the features of the innovation. These are the perceived usefulness, matching needs, intricacy, testability and visibility with the social system adopting the technology. The theory also holds that the acceptors can be clustered into several groups namely inventors, early acceptors, early common, late majority and laggards. Importantly, the theory holds that customers in the innovation adoption phases differ dramatically in their features (Fichman, 2000)

In Kenyan commercial banks, not all banks adopt the financial technologies and those that adopt do not adopt at the same time as per the theory. The categorization of the

adopters as per the theory are the innovators, fast adopters, earlier mainstream, late mainstream and the laggards and that would be used to prove or explain why some banks adopt financial technology before others.

2.2.3 Resource Based Theory

An organization can develop competitive advantage over its rivals when it has a strategic resource. These organizations can enjoy strong profits through these competitive advantages (Barney, 1991). Wernerfelt (1984) described tactical resource as a venture that is rare, valuable, hard to copy, and no substitutes. It can help firms to create strategies to capitalize on opportunities. Strategic resources give organization a competitive edge against their companies by aligning the resources, skills and expertise in core competence. In this case, core competence is what puts the organization a better place than its competitors (Chi, 1994).

Strategy is a plan and arrangement of actions that ensures the firm's objectives, polices and all of its activities are designed towards achieving the vision of the organization (Barney & Clark, 2009) A plan that is soundly connected with the company's objectives as well as aims take a critical part of gathering and also distribution of the company's finances into a practical background founded on the firm's potentials, external environmental set along with reliant shifts by their competitors. Mintzberg (1994) defines a strategy as a plan of actions that is designed to achieve certain goals and objectives.

2.3 Determinants of Financial Performance

The banking system economic achievement is determined by six factors derived from the revised CAMEL (Capital Adequacy, Asset quality, Management quality/Assessment,

Earning ability and Liquidity). These six components are indicative of bank being safe and sound as a financial institution (Dang, 2011). These were designed as a result of concerns relating to massive failures of banking institutions in the 1980s. The CAMELS is a powerful tool and its indicators are helpful to regulators, investors and customers in determining whether the bank has a risk of failure or they are safe to place the deposits or investments in such a bank. Financial technology and size of the firm are also be included as determinants of economic achievement of business financial institutions. The determinants are discussed in detail as follows:

2.3.1 Financial technology

FinTech can be described as technology-enabled financial solutions that cover up the whole commodities' scope conventionally offered by banks (Arner 2015). FinTech is also explained as a new form monetary service trade that merges IT with monetary services such as remittances, payments and also management of assets (Lee & Kim, 2015). A financial business comprised of firms that exploit technology to create efficient to the monetary systems (McAuley, 2015)

The appearance of technology has led to better ways of businesses in the modern era (Stiroh, 2001). Ongori and Migiro (2010) argued that ICT has conveyed an absolute change of standards on the performance of financial institutions and on the delivery of services to the clients in the banking business. In a proposal to take up with worldwide growth, advance the delivery of customer services, as well as lessen the transaction costs, banks have ventured enormously in technology moreover has broadly accepted Financial technology networks for delivering an extensive array of value added commodities. Financial technology acts as a catalyst for improved production as well as monetary

advance at the firm's intensity (Brynjolfsson & Hitt, 1996). Financial technology makes commodities more accessible and inexpensive by lessening costs of trading for the banks (Bames, 2014).

2.3.2 Size of the firm

Schmalensee (2001) define size in relations of total assets and exploited several accounting performance gauges taking in return on assets and profit margin. The firm's size can be measured in numerous ways: employees, sales, assets, along with value added are the frequently employed measures (Pandy, 2005). Lee (2008) indicates that an affirmative connection exists amid size and financial performance of a company because operating costs competences in rising along with economizing on component of expenditure. Liargovas (2008) points out those large firms are capable of diversifying their asset selections and this can lessen their operating risks. Liargovas and Skandalis (2008) suggest that big firms in general do better than small firms as they afford to use economies of scale and encompass the funds to draw as well maintain management capacity.

2.3.3 Capital Adequacy

Resource sufficiency refers the funds anticipated to retain an equilibrium with the exposure of risks to banks like market, operational and also credit risk, so as to take in the possible deficits in addition safeguard the bank's debt controller (Karlyn, 1984). The Capital adequacy Ratio which can also be referred to as capital-to-risk weighted assets ratio protects shareholders and as well uphold the permanence along with the effectiveness of economic structures around the globe. Two categories of capital are calculated: tier one capital that can take in deficits exclusive of a financial institution

being requisite to close down market, and tier two capital that can take in deficits in times of business termination and so offers a slighter level of shareholder protection (Karlyn, 1984).

2.3.4 Assets Quality

The quality of assets is one of the main reasons of most banks' collapse as noted by Grier (2007). Loan selection is part of the most essential asset categories among financial institutions. Accordingly, one of the greatest risks facing banks is the risk of loan losses as a result of bad loans. As stated by Frost (2004) the superiority of asset gauges shows the use of non-performing loan ratios that are the substitute of asset superiority and the provision or allowance to loan losses reserve.

The Regular categorization system states that loans are divided into five groups: the standard, sub-standard, special mention and doubtful as well as bad losses. NPLs refer to the debts falling under the three low classes which are overdue or those upon which interest has not been remitted for intern the acceptable ninety days. In certain jurisdictions regulators allow usually hundred and eighty days (Parven, 2011).

Credit is the main advantage of business financial institutions from which they produce profits. The profitability of banks is determined by the superiority of loan selection. The delinquent loans are the sources of the utmost risk faced by banks (Dang, 2011). It is a major concern of banks to keep the NPLs to the lowest altitude. This is since the NPLs influence the productivity of banks. According to the CBK, NPL was one of the main reasons why Chase bank failed in 2016. Thus, low NPLs is a reflection of the good health

of bank portfolio. Sangmi and Nazir (2010) stated that the lower the ratio the better bank is performing financially.

2.3.5 Management Efficiency

The efficiency of management is part of the major internal aspects that establish the bank performance. It is signified by various financial ratios such as earnings growth rate, total asset growth and loan growth rate. Management's performance is habitually articulated qualitatively through prejudiced assessment of administration structures, managerial control, regulatory rules, and work force superiority, among others. Nonetheless, a number of monetary ratios of the financial statements operate as a substitute for organizational competence. Management' ability to organize its funds competently, maximizing outputs, and lessening the operational expenditures can be calculated using financial ratios. One of these ratios can gauge excellence of the management in operating profits to income ratio (Sangmi & Nazir, 2010). A high operating profit to overall income is a reflection of competent organization in relations of functional effectiveness as well as generation of incomes.

2.3.6 Earning quality

Income quality relates to the total profits attributable to superior sales or inferior expenditures, relatively to fake incomes accrued from bookkeeping anomalies or activities like stock price change or varying depreciation or stock methodology. The earnings trends also allow the financial institutions to maintain a competitive edge by availing the funds required to execute the management's strategies and maneuvers (Dang, 2011). The profitability is estimated based upon the total asset growth rate (the average of

past asset growth ratio), loan increase ratio (average of past loan increase ratio) and earnings increase ratio (average of past earning increase ratio) (Jaffar & Manarvi, 2011)

2.3.7 Liquidity management

Liquidity can be explained as the bank's capacity to meet its obligations, primarily of shareholders. Lenders, investors, as well as directors all see to a firm's financial statements, employing liquidity measurement ratios to assess liquidity risk. This is normally through contrasting liquid assets with short term obligations. Firms that are over leveraged ought to make strides to cut down the space amid their cash on hand with their liabilities. Client deposit to total asset and total credit to client deposits are the most common financial ratios that reflect the liquidity situation of a bank (Dang, 2011).

2.4 Empirical Review

In this part, the researcher will evaluate international along with local studies in an attempt to identify the research gaps.

2.4.1 International Evidence

Kagan et al. (2005) evaluated the effect of internet banking on the functioning of community banks in America. They sampled a panel of the 60 largest EU banking groups from 1995 to 2005. The study adopted a descriptive design. Data were collected from the financial reports of the financial institutions of interest. Facts were analyzed by use of inferential analysis. The study found that banks that offered a broad choice 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.

De Young et al, (2015) studied the influence of internet on output and functioning 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. Secondary facts were gathered from the banks' yearly financial reports. The study found that in comparison to internet banks, the traditional community banks registered lower profits owing to lower business volumes (in terms of deposits and non interest income) and they also incurred high costs of labor. Nevertheless, the author is also quick to point out that the economic attainment breaches are speedily sealed through period because the influences of economies of scale.

Nader (2011) assessed the impact of banking innovations on the functioning of business financial institutions in Saudi Arabia between 1998 and 2007. The research employed an explanatory study design to evaluate the impact of the adoption of financial innovations among the banks in Riyadh between 2005 and 2009. Primary facts were gathered by use of questionnaires while secondary facts were gathered from the financial and yearly reports of the banks. He established that the use of mobile phone in banking, ATM networks along with the presence of branch networks positively impacted the profits and the efficiency of the banks in Saudi Arabia. Conversely, the study also discovered that the presence of a high number point of sale terminals, PC banking and the presence of mobile banking failed to advance competence in the profits.

Mabrouk and Mamoghli (2010) investigated the financial innovation and functioning of financial institutions in Malaysia. Explanatory research intends were adopted to evaluate the impact of the adoption of financial innovations among the banks in Kuala Lumpur between 2002 and 2009. The study variables were the two different adoption behaviours, one, the movers in the acceptance of the fiscal invention and secondly, copycats of the initial movers. Data was gathered from 32 officials who were bank managers, using interview guides. Data were analyzed using spearman rank order correlation co-efficient. They discovered that the first mover of the innovation in products increases the profits while the innovation in the process positively affected both the profits and banks became more efficient. The institutions that imitated thereafter did not realize as much profits compared to the first movers.

Kijjambi (2014) conducted a study on the factors responsible for the economic functioning of business financial institutions in Uganda. The research targeted all the licensed commercial banks in Uganda. Data for the research was gathered from published yearly financial statements of financial institutions. Linear multiple regression analysis was used in the period of 2000 – 2011.the paper established that organizational competence; interest income, asset quality, inflation along with capital adequacy are aspects influencing the functioning of local commercial financial institutions in Uganda over the period of study.

2.4.2 Local Evidences

Githakwa (2011) evaluated the degree to which ATM banking had been implemented by the commercial financial institutions in Kenya. He employed a descriptive study

propose to survey all the 44 commercial banks in the country in the years 2005-2010. The study made use of secondary facts both qualitative and quantitative. Regression and correlation examination 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.

Nyaga (2013) conducted a research on the effect of mobile money services on the accomplishment of small with medium sized firm in towns within Kenya. Data was collected in Naivasha municipality. The city was selected in a purposive sample for expediency from 31 municipals and 24 towns in the country. The study used secondary data from literature review even though primary facts were gathered to fill in recognized breaches. The study concluded that mobile money has made a considerable input to the accomplishment of small and medium sized firms in town centers. Many traders depend more on mobile money than the formal banking sector for their daily business operations. And also it was clear that the contributors in this research had a very good considerate of the primary roles of mobile services. Mobile money services clearly have a positive impact on productivity.

Muthoni (2011) did a case study on Kenyan Commercial Bank on measuring banks operational efficiency using DEA analysis. The research population was 168 branches of the financial institutions operating in the country in 2010. The paper made use of used secondary facts generated from the banks' database. The CCR model was used to compute the relative operational efficiency for each branch. The study found out that the average operational efficiency for the whole bank was 65%. Out of 168

branches, 25 branches were efficient with score of 1. Small and large bank branches were found to be more efficient than middle sized branches in terms of assets. The research results also established that the inefficiency was related to staff cost variable with only 41 branches out of 168 having surplus staff cost units.

Study conducted by Gitau (2011) investigated the connection amid economic improvement and fiscal performance of business financial institutions in Kenya over 5 years. The paper used quasi experimental propose. The study targeted 44 commercial banks in Kenya using primary facts assembled using questionnaires and secondary facts obtained from the financial results and publications of banks. The research concluded that 70% of institutions had adopted process innovations, 16% product innovations and 14% institutional innovations. The study also found out that there is an affirmative connection amid economic improvement and fiscal performance of business financial institutions. The paper found that the bank's fiscal performance is affected by the efficiency of financial innovation through a mean of 3.9 answering the question that to what extent did financial innovation affect bank's fiscal performance in Kenya. 23 companies were found to be operating efficiently out of 35 companies analyzed the company.

Kilonzi (2015) did a research on Mobile banking technology, innovation strategy and competitive advantage of commercial financial institutions in Kenya. The research target population was 43 commercial financial institutions of Kenya but only 40 of them participated the study. The study utilized primary data though questionnaires to the employees of commercial banks in Kenya. SPSS was employed to analyze the data. The paper findings concluded that investment in Mobile banking technology

will give banks a competitive advantage.

2.5 Conceptual Framework

Conceptual framework is a diagram that shows the how the independent variable is related to the dependent variable. Mobile and internet banking will be the independent variables in this study which will be measured by the value of transactions conducted through them. The dependent variable is indicated by Return on assets (ROA). Firm size and capital adequacy will used in the study as control variables. The effect of financial technology and financial performance variables is a shown in Figure 2.1.

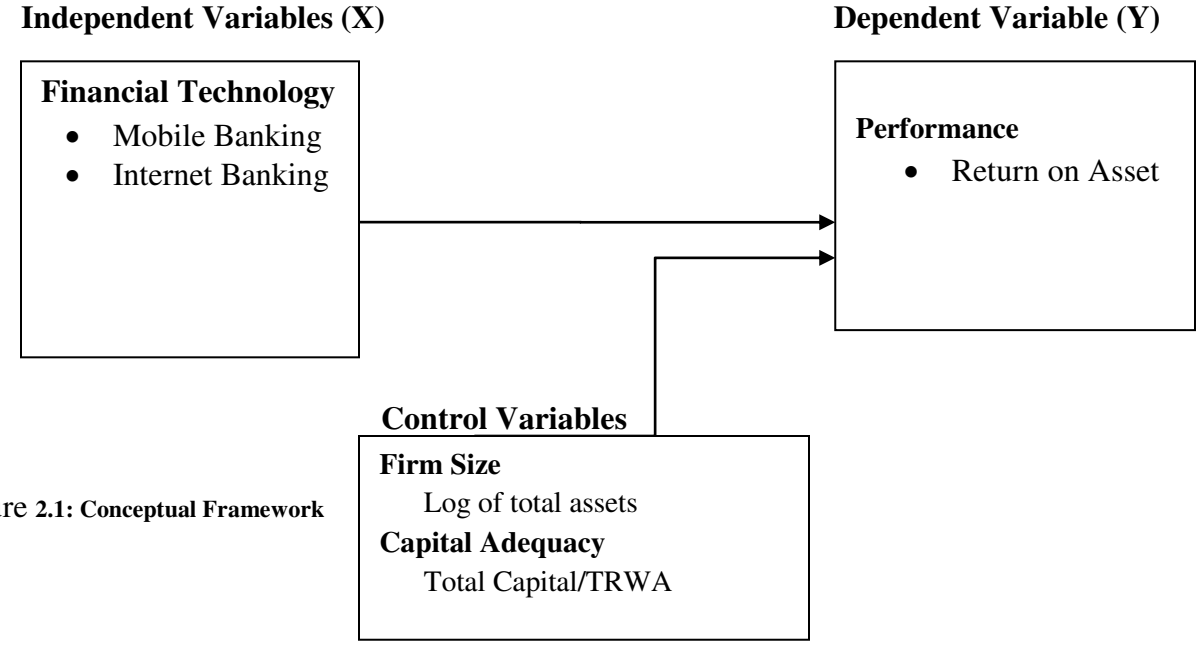

Figure **2.1: Conceptual Framework**

2.6 Summary of Literature Review

Kagan et al. (2005) carried out a research on the impact of internet banking on the functioning of community financial institutions in America. The paper established that banks that offered a broad array of banking services over the internet performed better than those without and also that the technology provides a higher return on equity."

(Nader, 2011) assessed the effect of banking innovations on the functioning of the commercial banks in Saudi Arabia. He concluded that mobile phone in banking, ATM networks and presence of branch networks positively impacted the profits and the efficiency of the banks in Saudi. De Young et al. (2015) investigated the impact of internet on output and functioning at community banks in Oslo, Norway. Their paper established that in contrast to internet financial institutions, the traditional community financial institutions registered lower profits owing to lower business volumes and they also incurred high costs of labor.

Locally, the research conducted by Nyanga (2013) on the effect of mobile money facilities on the functioning of small along with medium sized firm in town centers in Kenya concluded that Mobile banks has great impact on the functioning of small and medium sized firms in town centers in Kenya. Gitau (2011) made research on the connection amid monetary improvement with economic achievement of commercial financial institutions in Kenya over 5 years. The paper made a conclusion that there is a positive connection amid monetary innovation and financial achievement of commercial financial institutions in Kenya. In addition Kilonzi (2015) study on Mobile banking technology, innovation plan and competitive benefits of commercial financial institutions in Kenya concluded that investment in Mobile banking technology will give banks a competitive advantage.

In summary, this study has argued that FinTech affect financial performance of commercial banks. Nevertheless, it is not clear how FinTech in terms of Mobile money, Mobile banking with internet banking affects the Return on Assets of the commercial banks in Kenya which is the breach that this research intends to seal.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter will explain the methodology used to conduct this research. Research design, target papulation data collection method and also how the data was analyzed will be presented in this chapter.

3.2 Research design

Creswell (2009) defines study propose as a delineate of how facts were gathered and evaluated in quest of getting precise responds to study questions. This paper used a descriptive study propose as it emphasizes a feature behavior on one variable because of another variable (Kothari, 2005). This type of blueprint is suitable in finding the connection amid FinTech with economic achievement of commercial banks in Kenya.

The paper used a cross-sectional study since it seeks to observe data once over a five year period. Kothari (2005) defined cross sectional study as a study that is employed to explain the traits of features that subsist in a set of individuals, but it cannot be adopted to establish any connection that may subsist. This technique is employed to collect facts only. The facts could then be employed to extend other methodologies to examine the relation that is experimental.

3.3 Population

Kothari (2004) notes that population is a total collection of elements with apparent characteristics which can be used make inferences. The study population included all 43 commercial financial institutions licensed by the CBK, as at 31st December, 2017. Some

of these banks had not obtained licenses for all the 5 years under study. They were only 35 banks that had all the data available for the 5 years under study.

The study is conducted through a census survey targeting all the commercial banks in Kenya. Other studies such as Ongore (2008) used this approach to study among others board effectiveness. Further, Dennis (1989) when the sample is small it is important to take the whole population to determine the needs of an organization.

3.4 Data Collection Methods

The research used secondary facts since the nature of the data to be collected is quantitative in nature. So as to attain the study's objectives, secondary facts for a 5 year time gathered from financial statements of commercial financial institutions in line with the specific variables of this research. Having a time frame of 5 years offers an enhanced mode of determining movements (Kieso, et al. 2007). Further, other empirical studies done previously used the five year period for financial analysis

To attain a satisfactory depiction, the paper reviewed secondary facts for a time of 5 years (2013-2017). The time was selected with the considerate that FinTech acceptance by financial division actors has been on ascend in the last five years with various companies shifting from paper work to digital form of business. This data to collected specifically relates to the value of transactions performed using internet banking and Mobile banking.

3.5 Data analysis

The facts collected were scrutinized using SPSS (V. 22.0) and MS Excel. The findings of the study are presented in form of table and charts. Percentages mean and standard

deviation employed to determining the trend amid the variables. The study used Regression analysis to find the relationship amid the variables under investigation.

3.5.1 Diagnostic tests

Diagnostic tests were employed in the study to ascertain the reliability of the outcome. Autocorrelation and Multicollinearity tests are mainly to be diagnosed. Autocorrelation test is the measurement of the similarity between a certain time series and lagged value of the same time series over successive time intervals. It was tested using Durbin-Watson. This test reports a test statistic with a value of 0 to 4 where 2 is no autocorrelation, where the statistic is less than two there is positive autocorrelation and where greater than two there is negative autocorrelation (Khan, 2008). Multicollinearity Test to ensure the data collected is free from biasness and one variable data is not related to another variable data, the study conducted a multicollinearity test. It occurs when there is nearly exact or exact linear relation among two or more of the independent variables. The variance of Inflation is used to test multicollinearity. Whenever the values of VIF les between 1 and 10, then there is no multicollinearity while when the VIF is less than 1 or greater than 10, then there is presence of multicollinearity. When the test fails you should standardize the continuous variables by choosing on a standardization method on the regression dialog box. For instance you may choose variable centering approach (Cohen, West & Aiken, 2013). Heteroscedasticity test the study applied Breusch Pagan to determine the consistency of the variance across the observation. Heteroscedasticity occurs in cases in which variance is different across the observation. This may lead to a biased estimation.

3.5.2 Regression model

The paper adopted a regression model to institute the connection amid FinTech with economic performance of commercial banks in Kenya as recommended by Hair, et al. (2006). The model specification is presented here:

$$\mathbf{Y= \beta 0+\beta_1 X_1+\beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$

Y is the financial performance which is measured using Return on Asset (ROA= net income/ average total assets).

X1 Mobile banking which is measured using the log of Amount of Transactions performed via Mobile banking.

X2 is Internet banking which is measured by the log of Amount of Transactions performed via Internet banking.

X3 is Firm size (control variable) which is measured by log of total assets

X4 is Capital Adequacy (control variable) which is measured by Total Capital/TRWA

β0 = gradient of the regression gauging the sum of the vary in Y linked with a unit vary in X

ε = Error term within a confidence interval of 5%

3.5.3 Test of Significance

The regression analysis is used. The ANOVA test is adopted to determine the effect of independent variable on the dependent variable in the regression analysis and also to test the mean score differences and then use T- statistic test to establish the likelihood that there is a link between technology and performance which are the main data available. A significance level of 5% is used.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter explains how data analysis is conducted by the use of a linear regression model in order to determine the relationship between financial technology and financial performance of commercial banks in Kenya. The findings from the analysis are hereby discussed accordingly.

4.2 Response Rate

There are 43 licensed commercial banks in Kenya as per the figures obtained in the year 2017. Some of these banks had not obtained licenses for all the 5 years under study. They were only 35 banks that had all the data available for the 5 years under study. This gives a response rate of 83% which according to Mugenda & Mugenda (2003) a response rate above 60% is considered appropriate for data analysis and making statistical inferences.

4.3 Data Validity

In order to determine the validity of the data, diagnostic tests that included test of multi collinearity and Durbin – Watson test of residuals was undertaken. Presence of multi collinearity is shown by VIF value of more than 10, while presence of residuals from Durbin Watson is shown by a value greater than 4. The values for VIF are shown in table 4.5 while Durbin Watson value is calculated in table 4.3.

All variables have VIF values of less than 10, with the variable with the greatest VIF value being internet banking with a VIF value of 5.11. We can therefore conclude that there is no presence of multicollinearity in our data. On the other hand the Durbin –

Watson value for our data is 1.4 that shows that there are no residuals or autocorrelations in our data.

Heteroscedasticity in data analysis is a major concern as it can be used to invalidate the test of significance of data. In order to undertake linear regression, one of the conditions of the data is presence of homogeneity in the data. The variances of the groups of data should be similar. When this condition is not met, then heteroscedasticity sets in.

4.4 Descriptive Statistics

Descriptive Statistics explains the qualities of each variable in the form of the minimum, maximum, mean, standard deviation, skewness and kurtosis. Table 4.1 shows these qualities as follows.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Y = ROA	175	-8.0000	7.7000	2.33	2.75	-.948	.184	1.477	.365
X1 = Mobile Banking	175	-.6931	9.9714	3.83	2.68	.294	.184	-.643	.365
X2 = Internet Banking	175	-2.3026	5.7430	2.34	1.66	.039	.184	-.560	.365
X3 = Size	175	8.2188	13.2279	10.67	1.30	.180	.184	-1.231	.365
X4 = Capital Adequacy	175	5.0000	59.0000	22.56	8.42	1.374	.184	2.815	.365
Valid N (listwise)	175								

Source: Author, 2018

The dependent variable (Y) was measured by return on assets of commercial banks. The data collected for the five years shows that the bank that had attained the highest ROA and arguably the highest performance had 7.7% while the bank that recorded the least in the period had a loss of -8%. The mean for all the banks was 2.33 with a standard

deviation of 2.75. The data was negatively skewed with a moderate kurtosis that explains the sharpness of flatness of the distribution of this data.

The dependent variable X_1 that was measured by the natural log of number of transactions undertaken through mobile banking was one of the measures of financial technology. The highest value was 9.97 while the least had recorded a value of -.69. The average was 3.83 with a standard deviation of 2.68. This data is positively skewed with a kurtosis of -.643. The data had been scaled in form of billions of transactions.

The other dependent variable X_2 represented billions of transactions undertaken through internet banking. The natural logarithm of the variable was also determined to regularize the regression model. The maximum value for this variable was 5.74 and the minimum was -2.3. The mean was 2.34 with a standard deviation of 1.66. Data is positively skewed at .039 with a kurtosis of -.56.

The other independent variable was size (X_3) which was measured by millions of total assets, again the natural logarithm was used to regularise the model. The largest company recorded a value of 13.23 while the least recorded a value of 8.22. The mean for size was 10.67 with a standard deviation of 1.3. The data is positively skewed and a relatively flat kurtosis of -1.23.

The final independent variable was capital adequacy (X_4) that was measured as the percentage of total capital over total weighted risk on assets. The company that maintained the highest capital adequacy had 59% while the lowest had 5%. The mean was 22.56 % with a standard deviation of 8.42%. Data is positively skewed with a high kurtosis of 2.82

4.5 Correlation Analysis

Correlation analysis measures the relationship that exists between the variables. The study undertakes a Pearson correlation that measures the linear relationship of variables. A correlation of 1 shows a perfect positive correlation while correlation of 0 or value close to zero shows no relationship or weak relationship respectively. -1 value, shows a negative perfect relationship and values close to it have strong negative relationship. The table 4.2 shows the value of Pearson correlations for the variables.

In the table, we are interested on the correlation between the dependent variable with the independent variables. The correlation of mobile banking transactions against financial performance is 0.23 while correlation of internet banking against financial performance is 0.47. The two correlations are positive though they are weak as they are closer to zero than they are closer to one. The relationship of financial technology on financial performance is therefore positive relationship.

Table 4.2: Pearson Correlation

	Y = ROA	X1 = Mobile Banking	X2 = Internet Banking	X3 = Size	X4 = Capital Adequacy
Y = ROA	1				
X1 = Mobile Banking	0.22953189	1			
X2 = Internet Banking	0.47198346	0.823470693	1		
X3 = Size	0.5965882	0.694272253	0.823266473	1	
X4 = Capital Adequacy	-0.0695671	-0.490831344	-0.464304606	-0.352729609	1

Source: Author, 2018

Size has a positive correlation with financial performance. This means that the larger a bank is the higher the financial performance. This can be attributed to economies of scale that are enjoyed by large banks while at the same time they are able to retain clients more easily than the small commercial banks due to trust issues. The correlation is a strong correlation as the value is closer to 1 than it is closer to 0.

Capital adequacy shows the percentage of owners' capital over the total risk. A high value shows that the commercial bank has high capital over its risky assets. The relationship with financial performance is negative showing that companies with higher capital adequacy rate tend to have lower financial performance. This may be attributed to the fact that commercial banks are supposed by law to maintain a certain minimum capital reserve. Small banks when they comply with such requirements means that most of their assets are financed through equity and therefore do not benefit from tax shield that increases value of levered firms.

4.6 Regression Analysis and Hypothesis Testing

In order to determine the effect of financial technology on financial performance of commercial banks in Kenya, the following linear regression model was used.

$$\mathbf{Y= \beta_0+\beta_1X_1+\beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon}$$

A regression analysis was undertaken that had findings as stipulated below.

4.6.1 Regression Summary

A regression model summary was used

Table 4.3: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.674[a]	.454	.441	2.0561656	1.412

a. Predictors: (Constant), X4 = Capital Adequacy, X3 = Size, X1 = Mobile Banking, X2 = Internet Banking

b. Dependent Variable: Y = ROA

In the regression model summary table, the coefficient of determination that is denoted by R squared is given by 0.454. It shows the strength in which the model is able to predict the dependent variable. The value indicates that 45.4% of the variations in financial performance of commercial banks in Kenya can be explained by the model. The other 55.6% can only be explained by other factors that are not in the model.

4.6.2 One Way ANOVA

In order to determine the significance of the regression model and determine whether to reject or fail to reject the null hypothesis, a one way ANOVA is undertaken as shown in the table 4.4

Table 4.4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	598.197	4	149.549	35.373	.000[b]
	Residual	718.729	170	4.228		
	Total	1316.926	174			

a. Dependent Variable: Y = ROA

b. Predictors: (Constant), X4 = Capital Adequacy, X3 = Size, X1 = Mobile Banking, X2 = Internet Banking

Source: Author, 2018

The significance of the model is determined by comparing the p value with the alpha value. If the P value is greater than the alpha value then the model is said to be insignificant while the vice versa is true. The regression analysis is undertaken at 95 degrees of freedom which means the alpha value is 0.05. According to table 4.4, the p value is shown as 0.000 which shows that it is less than the alpha value. We therefore conclude that the relationship between financial technology and financial performance of commercial banks in Kenya is significant.

In order to determine whether to reject or fail to reject the null hypothesis we compare the F statistic and the calculated value of F as shown in the table 4.4. If the calculated value is greater than the F statistic then we reject the null hypothesis. According to the topic under study, the null hypothesis states that there is no effect of financial technology on financial performance of commercial banks in Kenya. The calculated value of F is 35.37 while the F statistic at an alpha of 0.05 and 4, and 170 degrees of freedom is 3.6. The calculated value is greater than the F statistic which means we reject the null hypothesis. We therefore conclude that there is a positive significant effect of financial technology on financial performance of commercial banks in Kenya.

4.6.3 Regression Coefficients

The coefficients that can be used by the model in predicting the dependent variable are shown in the table 4.5.

Table 4.5: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-12.880	2.010		-6.408	.000	-16.848	-8.912		
	X1 = Mobile Banking	-.505	.105	-.492	-4.798	.000	-.713	-.297	.306	3.269
	X2 = Internet Banking	.616	.212	.372	2.905	.004	.197	1.034	.196	5.109
	X3 = Size	1.409	.212	.667	6.653	.000	.991	1.828	.320	3.127
	X4 = Capital Adequacy	.030	.021	.091	1.381	.169	-.013	.072	.743	1.345

a. Dependent Variable: Y = ROA

The coefficients β_0, β_1, β_2, β_3 and β_4 are given by, -12.88, -.51, .62, 1.41 and .03 respectively. The error term is denoted by 2.01. The model therefore becomes

$$Y= -12.88 - 0.51 X_1 + 0.62 X_2 + 1.41 X_3 + 0.03 X_4 + 2.01$$

This model may therefore be used to show the effect of any of the independent variable on financial performance, when the variable is increased by 1 unit and all other variables are kept constant.

4.7 Discussion of Research Findings

The study undertook a linear regression model on data collected to determine the effect of financial technology on financial performance of commercial banks in Kenya. Diagnostic test was first conducted on the data in order to determine presence of collinearity or

presence of residuals in autocorrelations. Collinearity test undertaken showed that all variables had VIF values of less than 10 and therefore there was no collinearity among the variables. The Durbin Watson value was 1.4 which is less than 4 and therefore there were no residuals or autocorrelations that would imply error in the model.

There was a response rate of 83.3% that was huge enough to obtain conclusions from the findings of the data. The Pearson Correlation showed that both mobile banking transactions and transactions from internet banking (which denote financial technology) had a positive though relatively weak relationship with financial performance. This means that increase in financial technology would result to increase in financial performance of the commercial banks.

Regression analysis undertaken showed that the model would predict 45.4% of variations in financial performance of the banks. The other 54.6% however would be explained by other factors not mentioned in the model. The analysis showed that p value was less than the alpha value and therefore the relationship was significant. The null hypothesis was also rejected as the calculated value of F was greater than F statistic. In conclusion the study found out that there is a positive significant effect of financial technology on financial performance of commercial banks in Kenya.

The findings of the study support theories such as innovation diffusion theory, where financial technology as a new innovation is spread throughout the commercial banks in Kenya, in order to achieve better financial performance. The result of the study also supports the proposition by various studies that had previously been conducted. Nyanga (2013) agreed that mobile money improved performance of SMEs in various towns in

Kenya. Gitau (2011) and Kilonzi (2015) all indicates that mobile banking technology creates competitive advantage that leads to improved performance of various companies in various industries.

However, not all empirical studies agree with the findings of this study. In a recent study conducted by De Young et. al (2015) suggested that use of internet on undertaking transactions in community bank decreased the output as the volume of transactions decreased. This is a study that draws much attention as it suggests that before implementation of finance technology a conclusive research needs to be undertaken in order to determine the level of compliance with new technology. Factors such as perceived usefulness, ease of use and risk are important in determining whether the concept shall be adopted by the target market.

CHAPTER FIVE: SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter summarizes the study, makes relevant conclusions and recommendations. It also looks at the limitations of the study and makes suggestions for further research.

5.2 Summary of Findings

The regression analysis that was undertaken by the study showed that there was a positive significant effect of financial technology on financial performance of commercial banks in Kenya. The regression model that was used however was relatively weak as it only predicted 45.4% of the financial performance in commercial banks. The correlation between financial technology and financial performance is positive though relatively weak as the Pearson correlation was closer to zero than it was closer to one.

The other independent variables in the regression model were size and capital adequacy that was the control variables. Size has a significant correlation with financial performance as it is suggested that large commercial banks are able to enjoy from economies of scale. They are also able to attract and retain clients easier than smaller commercial banks that have higher risks of going under. Capital adequacy on the other hand measured the size of capital against the weighted risk of total assets. It shows the level in which owners' capital finances risky assets. The findings of the study are that increase in capital adequacy reduces financial performance of commercial banks in Kenya. This could be explained by the fact that increase in equity financing reduces the value of the firm as suggested by Modigliani and Miller. These firms enjoy less of tax shield that reduces their financial performance.

The study found out that the p value was less than the alpha value of 0.05 as it was 0.000. The F statistic was also less than the calculated value of F at 35.37 as the critical F value was at 3.6. The results were used to determine the significance of the relationship between the variables and whether or not to reject or fail to reject the null hypothesis.

5.3 Conclusion

From the findings of the study, various conclusions are made. The correlation analysis showed a positive correlation between financial technology and financial performance. The Pearson correlation value was 0.23 and 0.47 for mobile banking and internet banking respectively. This means that they are both positively correlated to financial performance though internet banking had a stronger correlation than mobile banking. It therefore follows that increasing financial technology would lead to increase in financial performance of commercial banks in Kenya. Increasing internet banking activity would result to a higher increase in financial performance than increase in mobile banking.

The regression model had a coefficient of determination (R Squared) of 45.4%, which means that the model could explain up to 45.4% of the variations in financial performance. Other variations in the financial performance represented by 54.6% are explained by other factors outside the model. We can therefore conclude that the model is fairly good in predicting financial performance.

Factors such as size had a positive correlation with financial performance which showed that large commercial banks enjoyed economies of scale and thereby they could be able to attract and retain customers easily. Capital adequacy on the other hand had a negative

correlation with financial performance of -0.07. This means that increase in capital adequacy ratio results in decrease in financial performance in banks. This could be explained by the fact that high capital adequacy ratio means that the company has made investment of its assets through equity as compared to debt. The company therefore obtains minimum tax shield element.

The study also concludes that financial technology significantly affects financial performance of commercial banks in Kenya. Commercial banks that intends to increase its financial performance could invest in improving its use of financial technology since it would result in an increase in financial performance.

5.4 Recommendation

From the conclusions made by the study, there are various recommendations that the study suggests. The commercial banks should sensitize more use of internet banking as increase in internet banking results to higher financial performance of commercial bank, more than mobile banking. In general sense the commercial bank should work on improving financial technology as the technology leads to increased financial performance in commercial banks.

Policy makers should set the required capital adequacy ratio that should be maintained by the banks according to size of the bank. In that case, the banks would be in position to enjoy equal chances of accessing external finance by way of debt. This would reduce the capital adequacy ratio of small banks that would mean that they would obtain external loans and enjoy tax shield benefits. There is however weak correlation between capital

adequacy and financial performance. This means that protection of depositors would take an upper hand in making such a decision than increase in financial performance.

5.5 Limitations of the Study

This study utilises secondary data obtained from Central bank supervision reports. The CBK obtains the financial reports for individual commercial banks and compiles a comprehensive report for the entire industry. Errors that might have been made in such capturing of the data would also affect the authenticity of the results in this study.

Data collected was limited to commercial banks in Kenya. The study therefore does not take into consideration similar factors and their effect on financial performance of commercial banks in other countries. The data was also limited to commercial banks while the financial industry in Kenya is composed of insurance industry, Saccos, and other NBFIs. Their effect of financial technology on financial performance was thereby assumed.

5.6 Suggestion for Further Research

The study looked into the effect of financial technology on financial performance of commercial banks in Kenya. A similar study could be done in other countries as well in order to determine whether the results are conclusive in a variety of populations or the results are unique to commercial banks in Kenya, more importantly with the knowledge that mobile banking has a better success rate in Kenya than in most of other countries at large.

The study finds that internet banking has a higher correlation to performance in commercial banks than mobile banking. This should be further looked into, in order to understand the reasons that would make internet banking result in higher financial performance than mobile banking. Mobile banking has higher number of transactions in majority of the banks than internet banking. Perhaps transactions by internet banking have higher value those results into higher transaction charges that consequently increase financial performance more than in mobile banking. Undertaking a study in this field would provide all these information that would be vital for decision making.

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APPENDICES

Appendix 1: Data used for the analysis

Y = ROA	X1 = Mobile Banking	X2 = Internet Banking	X3 = Size	X4 = Capital Adequacy
5.5	7.363913501	4.96284463	12.68637308	22.5
7.7	8.878079256	5.38907173	12.38084075	23.6
4.7	7.682021511	4.9698133	12.34092691	21.1
5.8	7.031741259	4.672828834	12.24052238	17.3
6	4.919980926	4.060443011	12.30376181	20.8
4.1	4.394449155	3.091042453	12.04781521	21
4.9	4.9698133	3.258096538	11.645146	21
5.5	0	2.708050201	11.61110425	19
4.6	3.850147602	3.044522438	11.63440831	14.8
7	-0.693147181	0	11.17385185	35.4
3.6	8.636929873	2.890371758	11.73512457	13.5
4	7.158513997	3.713572067	10.68053921	18.9
4.8	3.091042453	2.944438979	10.85942199	21.6
1.9	6.188264123	3.555348061	11.43488824	24.1
-3.3	4.762173935	2.197224577	10.51615651	30.6
3.8	2.63905733	2.48490665	10.80893976	18.4
2	3.610917913	2.079441542	10.8720481	12.7
4.1	1.945910149	2.197224577	10.33270174	41.5
1.6	2.302585093	1.791759469	10.1518309	33.8
2.7	3.713572067	2.079441542	9.683713319	18.1
4.2	5.402677382	2.079441542	9.487896348	21.4
4.3	0	0.693147181	9.521055144	19.8
4.3	1.098612289	1.098612289	9.306468399	33.2
1.3	4.634728988	0	8.85509298	25.8
2.9	2.890371758	1.791759469	9.885272664	15.1
2.5	1.386294361	0.693147181	8.854664928	30.4
3	1.791759469	1.098612289	9.459931093	18
2.3	3.583518938	1.098612289	9.175541866	31.4
1.8	-0.223143551	0	9.653807502	23.6
1.8	3.433987204	3.784189634	9.333000385	14.8

1.2	0.693147181	2.197224577	8.990815266	41.9
1	2.079441542	0.693147181	8.896861744	26.6
1.4	-0.356674944	0	8.659733878	36.3
-7.5	1.098612289	-0.916290732	8.218787156	46.9
-0.8	3.63758616	2.079441542	9.727883383	10.8
5.93	7.68294317	5.030437921	12.83991823	21
7.26	9.011645501	5.476463552	12.53219147	17.7
4.43	7.790282381	5.068904202	12.55210263	21.6
5.44	7.145984468	4.65396035	12.32848053	18.7
6.42	5.030437921	4.143134726	12.31329343	19.8
4.31	4.521788577	3.091042453	12.05144602	22
4.47	6.317164687	3.36729583	11.85776262	18.9
5.64	3.951243719	3.36729583	11.82991631	18.9
4.44	4.043051268	3.091042453	11.82837104	20.9
5.22	1.098612289	0	11.28222846	27.3
2.57	9.141097469	2.995732274	12.07715346	17.9
4.24	7.306531399	3.871201011	11.03186898	20.3
4.35	3.135494216	3.044522438	11.03400217	24.2
1.9	6.284134161	3.583518938	11.71884147	13.9
-1.09	3.784189634	2.197224577	10.73498263	19.8
4.18	2.302585093	2.564949357	10.91359644	16.8
0.33	3.850147602	2.197224577	11.03830319	15.9
3.74	1.945910149	2.197224577	10.44493937	39.4
2.08	2.48490665	1.791759469	10.40402039	25.9
3.11	3.912023005	2.197224577	9.891111281	13.5
4.61	5.811140993	2.079441542	9.667701926	20.6
3.68	0	0.693147181	9.755219536	19.2
5.29	1.098612289	1.098612289	9.404837505	37.2
0.73	4.248495242	0.693147181	9.481740612	26.1
1.49	3.258096538	1.609437912	9.972966972	17.2
1.07	1.386294361	0.693147181	8.9692874	25.6
2.59	1.945910149	1.098612289	9.586788531	16.6
1.86	3.761200116	1.098612289	9.234056899	21.7
1.88	-0.105360516	0	9.738259073	29.6

0.67	4.477336814	2.772588722	9.634169164	11.5
1.32	0.693147181	1.609437912	9.249753374	25.5
-1.02	2.302585093	1.098612289	9.089866219	18.8
1.28	-0.105360516	0	8.688959234	33.7
-6.97	1.609437912	-0.916290732	8.467162258	58.6
-1.82	3.737669618	1.791759469	9.620925683	11
5.01	8.195057691	5.141663557	13.05567	15.4
6.56	9.049702026	5.575949103	12.7406021	16.2
4.14	7.891330758	5.164785974	12.73537649	21.3
5.01	7.239214974	4.691347882	12.39318687	18.4
3.83	5.056245805	4.110873864	12.36363607	21.2
3.56	4.691347882	3.258096538	12.19893725	18.7
3.69	6.424869024	3.663561646	12.15975642	17.7
5.66	4.17438727	3.526360525	11.90392647	19.2
3.99	4.189654742	3.17805383	11.96248401	20.5
6.33	-0.510825624	0	11.38676115	28.3
3.14	9.46583494	3.135494216	12.19846377	17.9
3.55	7.454141078	4.204692619	11.30454737	18.9
3.65	3.044522438	3.135494216	11.12987721	27.1
-1.34	6.473890696	3.850147602	11.73842624	14
0.18	3.433987204	2.197224577	10.867177	25
3.99	2.397895273	2.564949357	11.08215793	17.3
-2.07	4.290459441	2.197224577	11.14591154	16.4
1.86	2.079441542	2.079441542	10.64929834	42.3
1.86	2.48490665	1.609437912	10.28786521	27.7
4.42	4.060443011	2.397895273	10.11512516	15.8
2.72	5.476463552	1.609437912	9.857810039	24.7
3.38	0	0.693147181	9.904487053	19.3
3.53	1.098612289	1.098612289	9.577757412	26.9
0.22	4.770684624	1.386294361	9.728062162	16.3
1.61	3.33220451	1.609437912	10.00143063	16.5
0.49	1.098612289	0	9.047350743	34.2
2.25	1.945910149	1.098612289	9.589393056	17.6
2.39	3.951243719	1.098612289	9.262268465	21.5

1.05	-0.105360516	0	9.737610048	27.3
0.07	4.584967479	3.218875825	9.589666822	15.3
1.6	0.693147181	1.945910149	9.261603666	24.1
-1.74	2.63905733	0.693147181	9.238636241	15.7
0.75	-0.223143551	0	8.644354337	33.1
-3.91	1.609437912	-0.916290732	8.959440144	23.8
0.35	3.761200116	1.791759469	9.556480014	9.4
5.64	8.38822281	5.288267031	13.13187401	19.9
6	9.107421318	5.686975356	12.84726579	15.5
5.15	7.917536354	5.267858159	12.76568272	22.8
4.02	7.329749689	4.691347882	12.46650427	17.9
5.1	5.043425117	4.189654742	12.4303116	20.9
3.37	4.700480366	3.33220451	12.23025293	18.5
3.64	6.616065185	3.850147602	12.40543157	18.5
5.27	4.33073334	3.610917913	12.00832877	18.1
3.66	4.262679877	3.401197382	11.99440672	21.6
5.84	-0.510825624	0	11.54562496	26.4
3.6	9.767725102	3.713572067	12.25903505	18.4
0.91	7.572502985	4.143134726	11.14810314	20.8
4.67	3.044522438	3.218875825	11.32547478	30.5
0.14	6.180016654	3.610917913	11.65367822	11.9
-6.13	3.871201011	2.397895273	10.7605377	19.4
3.57	2.772588722	2.564949357	11.08732908	22.2
-0.03	4.59511985	2.197224577	10.93303554	16.2
4.57	1.945910149	2.079441542	10.77509468	45.7
2.23	2.48490665	1.609437912	10.29617133	27.1
2.78	4.189654742	2.48490665	10.2093533	18.7
0.3	5.513428746	2.197224577	9.94630755	23.2
3.55	0	1.098612289	10.01695016	25.5
3.65	1.098612289	1.098612289	9.742907918	32.3
-3.12	4.8978398	1.098612289	9.662943487	20.1
0.99	3.433987204	1.609437912	10.0177979	16
0.36	1.098612289	0	9.2023082	38.7
2.05	1.945910149	1.609437912	9.595942851	19.6

1.53	4.158883083	1.386294361	9.255791635	20.8
0.58	-0.223143551	-0.105360516	9.706133573	25.1
-0.28	4.189654742	4.369447852	9.613268932	14
1.11	0	2.079441542	9.151333191	27.4
1.3	3.091042453	1.098612289	9.409355152	22.8
-1.93	0	-0.105360516	8.562931083	31.6
0.89	0	-2.302585093	8.630700432	38.7
-1.99	3.761200116	1.609437912	9.540938245	7.9
4.94	8.588024372	5.38907173	13.22785788	16.1
5.68	9.193092479	5.743003188	12.9150981	16.5
4.31	8.009363077	5.356586275	12.85534631	22.7
3.68	7.261225092	4.672828834	12.51238754	18
3.34	4.94875989	4.158883083	12.56068296	18.5
2.34	4.844187086	3.465735903	12.38592449	17.6
3.05	6.673297968	3.970291914	12.5064809	19
4.09	4.477336814	3.761200116	12.12243557	18.6
2.94	4.406719247	3.496507561	12.16949683	19.9
6.49	-0.510825624	0	11.49508731	25.6
3.13	9.971426536	4.394449155	12.34376724	17.3
-1.99	7.609366538	4.564348191	11.14260064	19.9
5.26	3.044522438	3.258096538	11.47347753	32.3
0.67	6.324358962	3.688879454	11.60770823	5.4
-2.68	3.850147602	2.079441542	10.88661416	16
2.59	2.772588722	2.63905733	11.24423523	22.5
0.06	4.709530201	2.197224577	10.90027012	15.8
4.72	1.945910149	2.197224577	10.94431182	54
0.87	2.302585093	1.609437912	10.22658503	26.9
0.81	4.304065093	2.564949357	10.35188443	15.8
-3.28	5.513428746	1.945910149	9.867963996	16.5
3.27	0	1.098612289	10.16527473	22.7
2.19	0.693147181	1.098612289	9.836706519	27.1
-5.93	4.852030264	0.693147181	9.461176908	19.3
0.82	3.465735903	1.609437912	10.11876021	15.1
1.1	1.098612289	0	9.266437111	33.9

1.44	1.945910149	1.386294361	9.667955074	20.2
0.52	4.382026635	1.609437912	9.239413619	30.2
0.35	0	0	9.700146629	23.6
1.25	4.356708827	4.919980926	9.761923988	15.3
1.01	0	1.945910149	9.163353581	27.4
1.24	3.295836866	1.098612289	9.579487217	15.9
-0.81	0	-0.356674944	8.541105011	42.6
0.21	1.609437912	-0.693147181	8.780326391	38.8
-3.26	3.828641396	1.609437912	9.507180382	5.1

Appendix II: List of commercial banks in Kenya

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

Source: CKB, 2017