THE EFFECT OF DIGITAL FINANCE ON FINANCIAL INCLUSION IN THE BANKING INDUSTRY IN KENYA

BY

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DECLARATION

This research project is my original work and has not been presented for a degree at any other university for examination.

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This research project has been submitted for examination with my approval as the University supervisor.

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LIST OF ABBREVIATIONS

ATM - Automated Teller machines

CBK - Central Bank of Kenya

DFS - Digital Financial Services

DOI - Diffusion of Innovations

GDP - Gross Domestic Product

IDB - Inter-American Development Bank

PEOU - Perceived Ease of Use

PU - Perceived Usefulness

SACCOs - Savings and Credit Cooperative Societies

TAM - Technology Acceptance Model

ABSTRACT

Digital financial services is vital to the public as it boosts security for their cash and it's more convenient compared to keeping money at home traveling with the money. However, the provision of digital finance involves the participation of different players such as banks/financial institutions, mobile network operators, financial technology providers, regulators, agents, chains of retailers and clients. Digital finance mechanisms also need improvement of infrastructures to make the services user-friendly, secure, and cost-effective manner. My research aimed at determining digital finance effect digital finance on financial inclusion in banking industry in Kenya. Digital financial services consisted of agency banking, mobile banking and internet banking while financial inclusion was proxied using credit penetration. The Research designed used in the research was descriptive statistics. Target population for this study comprised 44 banking in Kenya, comprising of 43 commercial banks and 1 mortgage financial institution as at 31/12/2015. The study used a sample of 13 banking institutions in Kenya. The sample was purposively selected to represent the 13 banking institutions in Kenya, which offer all the three digital financial services. The research employed secondary data, which was analyzed using regression and correlation analysis via the SPPS Version 21. Findings of the study found an insignificant negative relationship between agency banking measured in term of the number of agents, mobile banking measured by the number of mobile banking transactions and internet banking measured in terms internet banking transactions with financial inclusion in the banking industry in Kenya. The study concluded that digital finance doesn't have any correlation on financial inclusion in banking sector in Kenya since banking institutions adopt digital financial services to lower operating cost associated with opening and operating branches to improve their profitability and financial performance and not to foster financial inclusion. The study recommended that to ensure the usage and adoption of digital financial services bank should create more awareness of such services and offer them at lower cost to enhance the usage of digital financial services.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Budgetary and financial incorporation is a noteworthy giver to monetary development and neediness lessening as well as for the viability of money related arrangement transmission and budgetary segment steadiness (European Investment Bank, 2014). Prohibited from formal account are unbanked people who resort to casual components, for example, reserve funds gatherings, moneylenders or social bolster systems as opposed to keeping money and danger administration items. Be that as it may, throughout the most recent couple of years, a few sections of Africa have encountered noteworthy advances in monetary consideration utilizing computerized money related administrations and portable budgetary administrations (Dayadhar, 2015). Computerized innovation assumes a basic part in the day by day lives of numerous, especially needy individuals in creating countries. Digital financial services provide the means to overcome such obstacles, and can contribute to national economic growth (Asian Development Bank, 2016) and financial inclusion.

Digital finance has been internationally regarded as an adequate means of providing opportunities to promote financial inclusion through reduction of costs of providing these services (Asian Development Bank, 2016). Advanced account administrations are an inexorably turning into an essential part of the nexus amongst improvement and money related consideration. The utilization of computerized money related administrations has become essentially as of late among numerous individuals who have practically zero past involvement with formal monetary administrations (Villasenor, Darrell & Lewis, 2015).

The expansion of digital payment platforms has offered the opportunity to link poor people with providers of savings, credit, and insurance products (Radcliffe & Voorhies, 2012). Further, advanced account administrations developments and business sector improvements have opened open doors for lower-salary individuals with deficient money related administration choices (McKee, Kaffenberger & Zimmerman, 2015).

In Kenya, digital financial services have been a runaway example of overcoming adversity and the entrance to a formal budgetary administration enhanced from 19% in 2006 to 67% in 2013, which corresponds with the ascent of computerized money related administrations in Kenya. A large portion of the country tenants in Kenya have replied that they have used either or a blend of monetary administrations that is banks, funds and credit co-agents, microfinance establishments, computerized monetary administrations suppliers or casual gatherings (European Investment Bank, 2014). Kenya has made critical steps in progressing monetary incorporation as of late, as confirmed by an increment of 33 percent in the level of record infiltration at a formal budgetary foundation or portable cash supplier somewhere around 2011 and 2014. Rampart of the advancement in Kenya's monetary incorporation scene has been credited to the nation's energetic versatile cash biological system, which includes extraordinarily large amounts of take up (Villasenor, Darrell & Lewis, 2015).

1.1.1 Digital Finance

This refers to arrangement of some blend of money related and installment benefits that are conveyed and oversaw utilizing portable or Web advances and a system of specialists (Peake, 2012). As per the World Bank (2015), computerized money related administrations

allude to the utilization of advanced innovations (web, versatile correspondence innovation) to get to monetary administrations and execute budgetary exchanges. Thus, digital financial services generally refer to the far-reaching technologies available to perform financial services from a widespread range of providers to an extensive category of recipients. This is possible by use of digital remote means including e-money, mobile money, card payments, and electronic funds transfers (Asian Development Bank, 2016).

Computerized Financial Services (DFS) are basically about sparing cash, getting to credit and protection, and performing exchanges through advanced channels like cell telephones, cards, PCs, tablets, et cetera (Martin et al., 2016). Digital financial payment products allow users to access funds from far-flung business people, relatives and friends during moments of crisis, reducing the likelihood that they will fall into poverty, to begin with (Klapper, El-Zoghbi & Hess, 2016). Advanced budgetary administrations, for example, versatile cash furnish people with more prominent accommodation, protection, and, as a rule, improved security contrasted with putting away money at home or going with money (Villasenor, Darrell & Lewis, 2015). Computerized back likewise assumes an essential part for little organizations as it gives them access to fund alongside secure budgetary items, electronic installment frameworks and an opportunity to assemble a money related history (Mujeri, 2015).

Digital financial services addresses particular unending difficulties in the worth chain particularly those difficulties that need money related administrations arrangements, and where the conventional account division is not completely tending to the requests in rustic markets (Martin et al., 2016). Computerized money related administrations are a win–win for purchasers and suppliers. Customers can relocate their cash to a more secure

environment, execute and deal with their record in a more advantageous and prompt way and as it were that frequently saves them money (Peake, 2012). Digital payments also improve the delivery of government anti-poverty programs by reducing opportunities for corruption and ensuring funds reach their intended recipients (Klapper, El-Zoghbi & Hess, 2016).

Digital financial services encompass electronic installments, including retail installments via card or cellular telephone (Dayadhar, 2015). Specialists are the foundation to any DFS and they empower clients get to their records from any operators or country stores, where they can trade out and money out from their record without expecting to get to conventional physical saving money base (European Investment Bank, 2014). Mobile Financial Services or mobile money are also form the core part of DFS and as phone-based payments (Dayadhar, 2015). Mobile money services are used to keeping money administrations, execute budgetary exchanges and cover both value-based and non-value-based administrations (Martin et al., 2016). Another sort of DFS is web saving money, which alludes to a web entry by which customers can utilize different sorts of keeping money administrations going from bill installment to making speculations (Nicoleta, 2009).

1.1.2 Financial Inclusion

This refers to the access and applying set of adequate financial services by households and firms is essential for advancement as it can help poor family units enhance their lives while likewise impelling financial movement (IDB, 2015). Budgetary incorporation likewise implies that formal money related administrations, for example, store and bank accounts, installment administrations, credits and protection are readily available to consumers and

that they are actively and effectively using these services to meet their specific needs (Klapper, El-Zoghbi & Hess, 2016). Financial deepening on the other hand is the change or increment in the pool of monetary administrations that are custom fitted to the necessity of all levels in the general public (Bharat, 2014). The impact of expanding financial inclusion goes well beyond financial deepening and spans over a wide range of development goals (IDB, 2015).

Money related incorporation is additionally the method for interfacing three mists. That is a physical money cloud which is the legacy budgetary framework where most destitute individuals work today, a computerized cloud where cash is put away in a virtual record and a mental cloud (i.e. the mind) through which individuals decipher and arrange their money related lives (Radcliffe & Voorhies, 2012). Monetary consideration is used in portraying the low popularity of the financial institutions and as individuals have an opportunity to benefit from such institutions especially in accessing budgetary funds from reserves and financial advice as well (Hannig & Jansen, 2010). Budgetary incorporation assumes an imperative part in advancing all around oversaw monetary extending in low-wage states upgrades strength and ability to adapt to stuns, enhance macroeconomic adequacy, and bolster strong and tough comprehensive development (Bharat, 2014).

Financial inclusion is viewed as a vital method for reducing destitution and advancing a nation's more extensive monetary improvement (Buckley & Malady, 2015). Money related consideration cultivates comprehensive development as more fluctuated and open budgetary administrations bolster development and diminish destitution and imbalance. Budgetary consideration bolsters the perspective that advancement in money related part prompts the improvement of the economy all in all (Bharat, 2014). Money related

incorporation likewise begins from a large scale viewpoint. For the most part, there is direct relation linking monetary incorporation in a particular country and its growth as well as welfare, measured by GDP per capita (IDB, 2015). Financial inclusion is typically measured by gauging how many people own and use formal financial products (Klapper, El-Zoghbi & Hess, 2016).

1.1.3 Effect of Digital Finance on Financial Inclusion

Digital financial services are held out as key money related answers for enhancing monetary consideration (Buckley & Malady, 2015). The methodology of DFS has presented positive effect by initiating neighborhood and rustic economies through expanded cash dissemination, business development and work opportunities (European Investment Bank, 2014). Achieving financial inclusion requires bridging the gap between cash and digital payments (Dayadhar, 2015). Through digital financial services, poor households often need to accumulate sums of cash to invest in their micro-enterprises and to maintain precautionary cash to ensure that unexpected shocks. In addition, once customers are connected to a digital payment system, they are able to transfer money instantly and cheaply to friends, family and business collaborate (Radcliffe & Voorhies, 2012).

Empirically, a study by Kama and Adigun (2013) on financial inclusion in Nigeria, its challenges and the experiences of other jurisdictions found that deficient and wasteful innovation based offices by money related establishments, has restricted the accomplishment of critical extension in budgetary incorporation level in Nigeria. Bayero (2015) inspected the relationship between the cashless economy approach and money

related incorporation and uncovered that mindfulness, shopper/client esteem recommendation, and foundation had a solid noteworthy association with budgetary consideration while plan of action of monetary administration suppliers had an inconsequential association with money related incorporation. Andrianaivo and Kpodar (2011) considered the relationship between data correspondence innovation, monetary incorporation, and financial development and found that the spread of cellular telephones reinforces the impact of money related consideration on monetary development, especially in nations where portable budgetary administrations grab hold.

1.1.4 Banking Industry in Kenya

The Kenyan managing style in an account industry involves forty-three business banks and one home loan money organization (KPMG, 2014). The managing an account division in Kenya is directed by the organizations Act, the Central Bank of Kenya Act Cap 491, the keeping money Act Cap 488 and the smaller scale fund Act 2006 (Korir et al., 2015). Prudential rules acquainted in 2012 have assisted with enhance banks' danger administration hones (KPMG, 2014). As indicated by the Central Bank of Kenya Act, one of the essential part of the managing an account industry in Kenya is to encourage liquidity, dissolvability and appropriate working stable budgetary framework. The saving money industry in Kenya has an advantage base of over Kshs. 1.3 trillion is the biggest part in the Kenyan money related area and the segment assumes an urgent part in intermediation process amongst savers and financial specialists (Kamau, 2011).

The Kenyan saving money framework has seen some major monetary developments in the previous decade and in addition ventures to advance budgetary incorporation (Korir et al.,

2015). The managing an account segment in Kenya is all around created and energetic, while access to credit has been supported over the previous decade by the coming of portable and organization saving money (KPMG, 2014). A study by Kamau (2011) investigated the intermediation effectiveness and profitability in the keeping money segment in the post-advancement period in Kenya and reasoned that banks in can enhance execution by enhancing their innovation, aptitudes and developing their size of operations to be completely productive. In addition, Korir et al. (2015) analyzed the impact of budgetary developments on monetary execution of business banks in Kenya utilizing optional information and built up that there was a solid relationship between money related advancements and monetary execution.

1.2 Research Problem

Digital financial services furnish people with more noteworthy comfort, protection and improved security contrasted with saving money at home or carrying the money (Villasenor, Darrell and Lewis, 2015).However, the provision of digital finance involves the participation of different players such as banks/financial institutions, mobile network operators, financial technology providers, regulators, agents, chains of retailers and clients. The interaction of these actors and the conditions of the regulatory environment and market archetype pose complexities to all participants (Arenaza, 2014) thus negating their role in financial inclusion. Digital finance mechanisms also require a foundation of dependable and productive bases to make the services user-friendly, secure, and cost-effective manner (World Bank, 2015).

In Africa, Kenya has spearheaded an intriguing procedure of money related consideration through jumping to cell telephone installment arrangements (Hannig and Jansen, 2010). As per M'Amanja (2015), Kenya has grasped money related advancement to improve scope, decrease exchanges cost e.g. electronic cash exchanges, operator managing an account, and credit reference authorities. Be that as it may, in Kenya just a little extent of exchanges are made through advanced means due to customer trust, platform integration and interoperability issues of replacing paper with virtual currency (Parada & Greta, 2014). As such, although its contributions of digital financial services in financial inclusion have been documented, the concept of digital finance is still in its infancy in Kenya. Thus, the need to explore the impact of computerized money on monetary consideration in the keeping money area in Kenya.

Additionally, several scholars have also explored the concepts of digital finance and deepening financial inclusion. A study by Buckley and Malady (2015) concluded that digital financial administrations in developing markets experiences constrained uptake and use thus; they may have little effect on financial inclusion. In another study by Nwanne (2015) on the relationship between monetary consideration and financial development in Nigerian country occupants found that the manageability of money related incorporation to rustic inhabitants in Nigeria was the standard for monetary development and economy can't develop quickly without appropriate execution of budgetary consideration to provincial zones in Nigeria. Karpowicz (2014) found that bringing down imperatives on insurance guarantees higher development while money related avoidance can be handled through measures that lower the monetary interest cost.

A study in Kenya by Nyamongo and Ndirangu (2013) on the effects of economic creativity in the banking sector in Kenya found that innovations had improved the monetary policy environment and proportion of the unbanked population had declined. A study by Kenyoru (2013) examined the link between financial innovations and financial extending in Kenya and inferred that money related development had an immaterial positive effect on budgetary developing. Based on the reviewed studies it evident that most studies focus more on financial innovations and its impact on the banking sectors hence there no conclusive study on digital finance and deepening financial inclusion. Henceforth the inquiry: what is the effect of digital finance on financial inclusion in the banking industry in Kenya?

1.3 Research Objective

To examine the effect of digital finance on financial inclusion in the banking industry in Kenya.

1.4 Value of the Study

The examination discoveries of this study will be of advantage to the administration of monetary organizations, as its discoveries will set up whether advanced fund is a method for money related consideration in the managing an account industry in Kenya.

The findings in the study will also be of benefit to investors as it will establish the existing pros and cons of digital finance as a means of deepening financial inclusion.

The study findings will also be of significance to various law designers and makers, including the administration of Kenya and Central Bank who are involved formation policies to regulate the banking industry in Kenya.

Lastly, the research findings will provide additional literature to scholars who intend to evaluate the impact of digital finance on economic inclusion in the emerging banking industry in the country.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section outlines the literature review, as well as the determinants in deepening financial inclusion, within the empirical literature review plus the summary of the review.

2.2 Theoretical Literature Review

The theory of financial innovations, the innovation acknowledgment model and the dispersion of development hypothesis will be utilized to explain financial inclusion and digital finance adoption respectively.

2.2.1 Theory of Financial Innovations

The theory of financial innovations was proposed by Silber (1983) premised on the idea that benefit expansion of money related foundations is the key reason of financial inclusion (Li and Zeng, 2010). The theory demonstrates that the primary thoughts behind the new innovations are the defects of the money related business sector, mostly the deviated data, office expenses and exchange costs (Błach, 2011). According to the theory, financial related innovations can be very new resolutions or simply customary means whereby latest component of development has been offered, enhancing firms' liquidity as well as expanding quantity new applicants**,** due to their qualifications on the situation (Ionescu, 2012).

According to the theory, financial innovation is a critical motivating force of the financial system, which leads to better economic competence and enhanced economic advantage derived from the new and frequent changes (Sekhar, 2013). Financial innovations define financial developments by coming up with new ways of production, technological solutions, creating better return rates hence boosting the country's economy in general. The theory posits that the innovativeness improves the firms' competitive edge of a corporate and generates more earnings to the investors (Błach, 2011). Innovation is a tool used to solve, manage and transfer the entire extra burden. The application of innovations promotes growth of financial entities through improved allocation, efficiency and a reduction of financial and administration costs (Sekhar, 2013).

Financial innovations enhance financial markets liquidity; ensure the allocation of resources to insufficient areas as well as improving the accessibility to emerging prospects (Błach, 2011) hence deepening financial inclusion. The theory of financial innovations posits that some restrictions including external handicaps helps corporations in their pursuit of their objective which is maximization of revenues (Li & Zeng, 2010) hence commercial banks come up with innovative ways to reach more people to improve their profits. The emerging innovative financial inclusion models through mobile and other digital financial services especially in many African countries which are assisting in closing the gap of financial instruments which exists in these countries (Omwansa & Waema, 2014).

2.2.2 Technology Acceptance Model

This model was originally put forward by Davis (1986) to expounding on attitude behind the urge to employ technological knowhow (Monyoncho, 2015). TAM deals with

perceptions and not systems real usage and argues when new technological advancement is introduced to the customers, either one of this occurs that is, Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) influence their decision (Lule, Omwansa & Waema, 2012). PEOU is the level of confidence that people put on a system and if users perceive a new technology to be beneficial in support of both short and long-run, there is that encouragement to use the system. Further, the level by which an individual consider a system will boost performance in the short and long-run is the PU (Mojtahed, Nunes & Peng, 2011).

The TAM affirms that the systems real utilization is established by each user's behavioral intention for usage and is inspired by an individual's perception to the system**.** The theory also explains that the perception towards new technology has a direct relation to its functionality as well as the simplicity of the system (Lim & Ting, 2012). TAM considers that acceptance of technology and functionality is influenced by consumer's intentions that establish the customer's perception towards system (Mojtahed, Nunes & Peng, 2011). The theory also supports that the recognitions or suspicions about the advancement are instrumental in the improvement of states of mind that will in the long run result in system usage conduct (Lim & Ting, 2012).

TAM also explores the attitude of individuals towards particular system (Lule, Omwansa & Waema, 2012). The TAM gives details and clarifies and portrays the reasons why clients acknowledge or dismiss an advancement or data framework. TAM is important both as a prescient strategy, considering the objective to evaluate the probability of individuals and associations to receive a specific innovation (Mojtahed, Nunes & Peng, 2011). TAM can be used to explain the digital financial services which can be applied in clarifying the

existence of variations in consumer behaviors especially when it comes to use of related digital financial services (Lim & Ting, 2012).

2.2.3 Diffusion of Innovation Theory

The Diffusion of Innovations (DOI) theory was proposed by Rogers (1995) to explain the approach through which innovation can be passed via different ways over certain period among different users (Sarker & Sahay, 2004). DOI theory explores the ways in which innovative ideas are passed from one generation to the other. According to DOI theory, an innovation is conveyed through various channels continually among individuals of the same social beliefs (Echchab & Hassanuddeen, 2013).The dispersion of Innovation hypothesis looks at the rate at which new advancement are spreading, how the new development is spreading and reasons why it is spreading with a specific end goal to research the elements influencing the selection of new data innovation advancement (Monyoncho, 2015).

The diffusion of innovations theory explains that innovationists apply normal distribution curve which can be partitioned into five segments to categorize users in terms of innovativeness. Diffusion theory explains that the crucial aspect in establishing implementation of innovation is: absolute advantage, companionable, simplicity, trial ability as well as ease to be detected (Monyoncho, 2015). DOI also classifies users as modernizer**,** early modernizers, and timely mass**,** late mass and stragglers (Echchab & Hassanuddeen, 2013). DOI theory perceives innovations to be passed on via several ways several in a span of time as well as a certain system (Sarker & Sahay, 2004). DOI theory

tries to explicate as well as illustrate the approaches in which innovations that are digital financial services are adopted and becomes successful.

2.3 Empirical Literature Review

Dabla-Norris, Yan and Filiz (2015) examined three measurements of money related incorporation to be specific access, profundity and intermediation productivity. The study utilized firm-level information from the World Bank Enterprise Survey for six nations at different degrees of financial improvement—three low-wage nations (Uganda, Kenya, Mozambique), and three developing business sector nations (Malaysia, the Philippines, and Egypt). The study discoveries built up that lightening diverse monetary contacts have a differential effect crosswise over nations, with nation particular attributes assuming a focal part in deciding the linkages and tradeoffs between consideration, GDP, imbalance, and the dispersion of additions and misfortunes.

Akhisar, Tunay and Tunay (2015) researched the impacts of the bank's productivity execution of electronic-based managing an account administrations in 23 created and building up nations' electronic keeping money administrations through 2005 utilizing dynamic board information techniques. The discoveries of the study set up that bank productivity of created and creating nations was influenced by the proportion of the quantity of branches to the quantity of ATMs and were profoundly critical and electronic managing an account administrations in huge. The concentrate likewise found that a few

variables had a negative relationship, due to differing qualities in the level of advancement of the nations, the socio-social structure and electronic managing an account base.

Ranjani and Bapat (2015) analyzed whether individuals who have ledgers alongside access to different wellsprings of credit use financial balances adequately and whether holding financial balances encourage managing an account propensities in these individuals. This examination undertaking was led crosswise over 550 respondents for the most part borrowers of microfinance organizations to find out whether they had financial balances and what their observations about banks were. This study reasoned that basically having a record with a bank did not bring about the borrowers utilizing saving money administrations and that they liked to manage organizations that permitted more adaptable administrations than the bank. The concentrate additionally found that to have the capacity to accomplish incorporation, it is insufficient if ledgers are opened.

Monyoncho (2015) inspected the relationship between E-Banking advances and money related execution of business banks in Kenya utilizing optional information for a time of five years. The discoveries of the study uncovered that ATM developments, Mastercards, portable managing an account and web keeping money offer the comfort of directing a large portion of the saving money exchanges at the time that suits the client. The study presumed that selection of E-Banking advances affected the execution of business banks in Kenya and prescribed that business banks ought to keep putting resources into saving money innovations.

Terfa (2015) inspected the impact of budgetary creative procedures on neediness decrease in provincial northern Nigeria to build up whether the poorest wage quintile benefits the most from such techniques in various situations. The study discoveries set up that conventional product protection benefits for the most part rich ranchers, and poor agriculturists underutilize microfinance organizations quickened formal access to credit. The concentrate likewise settled that loaning to rustic ranch family units sorted out into funds clubs profited the poorest of poor people. The concentrate additionally found that redirecting from conventional yield protection to option protection would help poor ranchers adapt or adjust to covariate and unconventional agrarian stuns in creating nations.

Njenga, Kiragu and Opiyo (2015) inspected the impact of money related developments on budgetary execution of SACCO's in Nyeri County, Kenya. The study utilized a cross sectional overview research plan utilizing a specimen of 30 SACCO's and a semi-organized poll to gather information for the study. The study discoveries built up that phone keeping money and web saving money were measurably noteworthy. The study inferred that there is a remarkable relationship between monetary advancements and the money related execution of SACCOs and that phone managing an account and web keeping money are the fundamental drivers of the budgetary execution of SACCOs.

Bakang (2015) investigated the effects of financial deepening on economic growth in the Kenyan banking sector using quarterly time series data from 2000 to 2013. Financial deepening, the was captured through Liquid Liabilities as ratio to nominal Gross Domestic Product; Credit to the Private Sector as ratio to ostensible GDP; Commercial Bank Assets as proportion to business bank resources in addition to Central Bank Assets and Commercial Bank Deposits as proportion to ostensible GDP. Genuine GDP was measured

by Economic development. The study verified that keeping money segment in Kenya has an imperative part during the time spent financial development. The outcomes additionally settled that fluid liabilities, credit to the private area, business national bank resources and business bank stores have positive and factually noteworthy consequences for GDP.

Muiruri and Ngari (2014) inspected the impact of monetary advancements on the money related execution of business banks in Kenya with spotlight on Mastercards, portable keeping money, web managing an account and organization saving money. The study utilized a specimen of sixteen banks and gathered information from four individuals from the administration group utilizing surveys. The study confirmed that a few banks in Kenya had received some monetary advancements, for example, charge cards, versatile, web and organization managing an account. The concentrate likewise found that budgetary advancements greatly affected the money related execution of the business banks.

Mbutor and Uba (2013) analyzed the effect of money related consideration on fiscal strategy in Nigeria somewhere around 1980 and 2012. The discoveries of the study built up that developing money related consideration enhances the viability of fiscal strategy. The concentrate likewise found that the coefficient of the quantity of bank offices has the wrong sign. This is on account of opening branches, banks for the most part seek after benefits however not money related incorporation, which is an approach objective, so that there are bunches of branches, which are under-used while various areas, which are considered not good for asset reports, are under-expanded.

Nyambariga (2013) inspected the impact of money related advancement in the execution of business banks in Kenya with spotlight on versatile managing an account, office keeping

money, robotized teller machines and plastic card utilization utilizing optional information. The study uncovered that portable managing an account, robotized teller machines and card use positively affected execution of business banks in Kenya. The exploration likewise uncovered that organization managing an account negatively affected execution of banks. The study reasoned that money related advancements influence business banks execution therefore business banks ought to set up a suitable domain to upgrade organization managing an account, portable keeping money, ATMs and card use developments to enhance the execution of business banks consequently enhancing Kenya's economy.

Ngungi (2013) researched the effect of internet depending on money related execution of business banks in Kenya. The study did an enumeration of the 43 business banks in Kenya and gathered essential information through surveys. The study reasoned that web saving money affected the monetary execution of business banks in Kenya. The study recommended that banks should rally more clients to use internet banking as based on the results of the study, internet banking services were very useful in addressing lowering costs to the bank and customers, security and accessibility by users.

2.4 Determinants of Financial Inclusion

This section will as explore financial innovations, accessibility to financial services, intermediation efficiency and financial literacy as the main determinants of financial inclusion.

2.4.1 Financial Innovations

Financial innovations are portrayed as any new progressions in money related instruments (altogether new instruments, change of conventional instruments, joining of customary

instruments, new use of existing instruments (Błach, 2011). Monetary advancements in the money related segment allude to improvement of new items like arrangement of new administrations like web saving money, phone managing an account, new generation process like electronic record keeping or new hierarchical structures (Njenga, Kiragu & Opiyo, 2015). In the monetary administrations industry, advancement is seen as the demonstration of making and promoting new money related instruments, advances, markets and establishments, which encourage access to data, exchanging and method for installment (Korir et al., 2015). Money related developments are perceived as a basic wellspring of financial development and of enhancements in social welfare. Monetary developments have been perceived as having awesome potential for building social and atmosphere versatility (Terfa, 2015).

2.4.2 Accessibility of Financial Services

Access to financial administrations is characterized by the supply of the same and is an important condition for money related incorporation (Tuesta et al., 2015). Obstructions to get to ordinarily reflect contortions identified with lack of physical managing an account base, key documentation necessities by banks for opening, keeping up, and shutting accounts, advance application, and additionally diverse types of boundless proportioning, including formality and the requirement for casual underwriters as associations with access fund (Karpowicz, 2014). In that capacity, there is a positive relationship between more prominent money related consideration and better access to formal budgetary administrations as lower managing an account costs, more prominent nearness to bank offices and less printed material (Tuesta et al., 2015).

2.4.3 Intermediation Efficiency

Intermediation efficiency is usually connected with the condition of rivalry and the level of data confronting money related foundations, and is displayed in premium spreads and banks' overhead costs (Karpowicz, 2014). Monetary intermediation process includes the change of obtained assets from savers (surplus spending units) and loaning those assets to borrowers (deficiency spending units). Budgetary intermediation additionally assumes an essential part in the distribution of liquidity in present day economies. In this manner, the intermediation technique subsequently respects stores, capital and work as inputs, which are utilized for delivering the other managing an account yields, for example, credits and ventures (Kamau, 2011).

2.4.4 Financial Literacy

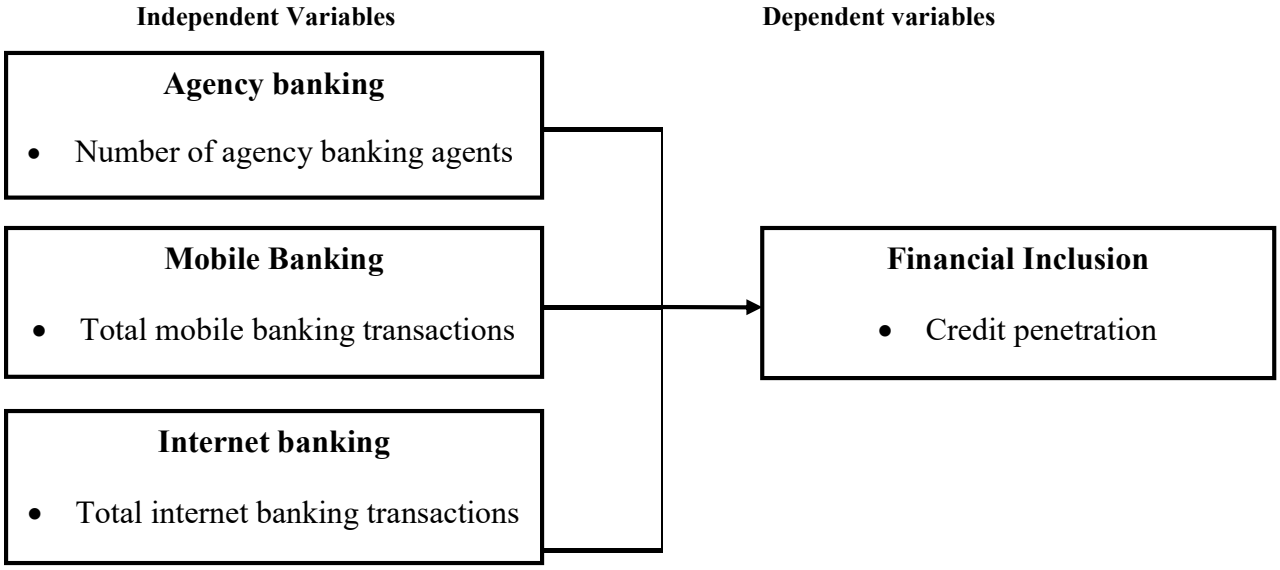
Financial literacy as defined as the blend of mindfulness, information, aptitudes, mentalities and practices important to settle on strong money related choices and in the long run accomplish individual monetary prosperity (Lewis and Lindley, 2015). Money related education is a foremost element for settling on sound monetary choices and influences the apparent expense of budgetary administrations. Budgetary learning likewise influences the impression of expenses and tradeoffs in various money related items supporting sound monetary choices (Karpowicz, 2014). Money related Literacy is the underlying stride towards accomplishing monetary consideration. It is considered as the interest side of monetary incorporation and is respected an indispensable aide for advancing budgetary consideration, money related improvement and eventually money related dependability. Money related proficiency additionally gives people with

fundamental devices to planning, help them to gain the order to spare and in this way, guarantee they can appreciate a noble life after retirement (Ramakrishnan, 2012).

2.5 Conceptual Framework

A conceptual framework is a diagrammatical representation that reveals the relationship amongst autonomous and ward variable. For this study, digital financial services consist of agency banking, telephone banking and internet banking while financial inclusion was proxied using credit penetration. Theoretically, the theory of financial innovations suggest that application of digital financial innovations enhance financial inclusion while the Technology acceptance model postulate that acceptance of digital financial services enhances accessibility of financial services by various users. Empirically several studies shows that the digital financial innovations influence not only the performance of banking institutions but also enhance the access of financial services without the presence of the traditional banking infrastructure. The study's conceptual model is shown by figure 2.1 as follows.

Figure 2.1 Conceptual Model



Source:Researcher

2.6 Summary of the Literature Review

The evaluated studies concur that access to monetary administrations has basic influence being developed by encouraging financial development and lessening salary disparity. Moreover, the reviewed studies show that various forms of digital financial services the speed, security, transparency, and cost efficiency needed to the banking sector. Studies byNyambariga (2013), Terfa (2015), Muiruri and Ngari (2014) and Njenga, Kiragu and Opiyo (2015) focused on financial innovations and performance of banks. Akhisar, Tunay and Tunay (2015), Monyoncho (2015) and Ngungi (2013) focused on electronic banking and performance of banks. Dabla-Norris, Yan and Filiz (2015) explored dimensions of financial inclusion and Mbutor and Uba (2013) focused on financial inclusion and monetary policy. However, it is evident that the reviewed empirical studies focus more on

financial innovations and performance of commercial banks hence an empirical research gap.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The section outlines the study design, the research's population, methods of data collection and the analysis procedure.

3.2 Research Design

The study employed a descriptive research design. Lavrakas (2008) posits that a descriptive study design is a non-experimental research designs across several disciplines to collect large amounts of survey data from a representative sample; sampled from the study population. Additionally, a descriptive research plan guarantees complete description of the situation, ensuring that there is minimum bias in the collection of data from the study population (Cooper & Schindler, 2008).

3.3 Population of the Study

The population for this study was made of the 44 banking in Kenya, which are licensed and regulated by the Central bank of Kenya. The 44 banking institutions comprised of 43 commercial banks and 1 mortgage financial institution as at 31/12/2015 (See Appendix I).

3.4 Sample Design

A sample design is a system or the methodology the scientist embraces in selecting things for the example. This study used a sample of 13 banking institutions in Kenya. The sample was purposively selected to represent the 13 banking institutions in Kenya, which offer all

the three digital financial services (agency banking, mobile banking and internet banking) under consideration in the research. Purposive includes the planned choice of specific units of the universe for constituting an example, which speaks to the universe or population.

3.5 Data Collection

The research employed secondary data. Data on digital finance comprised of three digital finance services used in the banking industry in Kenya namely agency banking, mobile banking and internet banking. The data on digital financial services and financial inclusion was obtained from the Central bank of Kenya yearly managing an account supervisor reports for a period of 5 years from 2011 to 2015.

3.6 Data Analysis

The data collected was analyzed using regression and correlation analysis via the statistical package for social sciences version 21. Correlation analysis was used to determine the nature and the degree of the relationship between the study variables while regression analysis was used to establish the existing relationship between the dependent and independent variables.

3.6.1 Analytical Model

Mathematically, the regression equation was expressed as follows:

$$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where; Y = Financial inclusion determined using credit penetration as a proportion of total loans and advances to gross domestic product (GDP)

X_1= Agency banking determined using natural log of the total number of agents offering agency-banking services

X_2 = Mobile banking determined using natural log of total mobile banking transactions

X_3= Internet banking determined through natural log of total internet banking transactions

β_o= Constant

β_1 , β_2&β_3 = Regression coefficients

ε = Probable error term

3.6.2 Test of Significance

The study used the t and F-test to determine the statistical significance. The F-test was utilized to test the significance of whole model, i.e. the goodness of fit while the T –test was utilized to test the significanceof the regression coefficients at 5% level of significance.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

This chapter provides an analysis of the research findings and presents the results obtained. The chapter presents the descriptive statistics, correlation analysis, regression analysis and the interpretation of the findings.

4.2 Descriptive Statistics

This study targeted 13 commercial banks, which offered all the three digital finance services including mobile banking, agency banking and internet banking. However, complete data was obtained from 12 commercial banks, which were fully functioning. The 12 banks made up a response rate of 92.3%. The study also explored the summary descriptive statistics of the findings. Table 4.1 shows the descriptive statistics results

Table 4.1 Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Financial Inclusion (ratio)	.011	1.130	.28285	.334670
Number of agents (ln)	8.7800	10.6100	9.928000	.6640829
Mobile banking transactions (ln)	15.9600	16.3800	16.202000	.1586041
Internet banking transactions (ln)	10.9600	11.7100	11.502000	.2811646

Source: Research Findings

Table 4.1 indicates that financial inclusion had a mean value of 0.283 and minimum and maximum values of 0.11 and 1.130 whereas the average number of agents in terms of natural log was 9.928 and minimum and maximum values of 8.78 and 10.61 respectively. The results on the table also indicate that average mobile banking transactions in terms of natural log was 16.02 and minimum and maximum values of 15.96 and 16.30 while the average internet transactions in terms of natural log was 11.502 and minimum and maximum values of 10.96 and 11.70 respectively.

4.3 Inferential Statistics

Inferential statistics contain the correlation analysis results, the model summary, the regression coefficients and the ANOVA findings

4.3.1 Correlation Analysis

Table 4.2 shows the correlation matrix

Table 4.2 Correlation Matrix

	Financial Inclusion	Number of agents	Mobile banking transactions	Internet transactions
Financial Inclusion	1			
Number of agents	-.128	1		
Mobile banking transactions	-.135	.982**	1	
Internet banking transactions	-.098	.920**	.831**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research Findings

Table 4.2 shows that agency banking measured by the number of agents, mobile banking measured in terms of mobile banking transaction and internet banking measured in terms of the total internet banking transactions had a negative correlation with financial inclusion.

4.3.2 Model Summary

Table 4.3 illustrates the model summary results

Table 4.3 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.210[a]	.044	.007	33.590440

a. Predictors: (Constant), Internet banking transactions, Mobile banking transactions, Number of agents

Source: Research Findings

Table 4.3 indicates that the R square (coefficient of determination) is 0.044, which indicates that, the independent variables explains only 4.4% of the variation in the dependent variable (financial inclusion). Thus, 95.6% is explained by other factors not considered by the research.

4.3.2 Regression Coefficients

Table 4.4 shows the results obtained

Table 4.4 Regression Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	70.517	40.914		1.724	.090
	Number of agents	-.757	1.292	-.078	-.586	.560
	Mobile banking transactions	-.596	2.268	-.035	-.263	.794
	Internet banking transactions	-1.701	1.262	-.178	-1.348	.183

a. Dependent Variable: Financial Inclusion

Source: Research Findings

Table 4.4 indicates that there is an insignificant negative relationship between agency banking measured in term of the number of agents, mobile banking measured by the number of mobile banking transactions and internet banking measured in terms internet banking transactions with financial inclusion in the banking industry in Kenya. Thus, the resultant regression equation was as follows

$$Y = 70.517 + -0.757X_1 - 0.596X_2 + -1.701X_3 + \varepsilon$$

4.3.3 ANOVA

Table 4.5 shows the Analysis of Variance (ANOVA) results.

Table 4.5 ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2903.998	3	967.999	.858	.468[b]
	Residual	63185.791	56	1128.318		
	Total	66089.788	59			

a. Dependent Variable: Financial Inclusion

b. Predictors: (Constant), Internet transactions, Mobile banking transactions, Number of agents

Source: Research Findings

The results on table 4.5 show that there is no significance relationship between digital financial services and financial inclusion in the banking industry in Kenya. This is indicated by the significance value (0.468>0.05).

4.4 Interpretation of the Findings

The study found that that agency banking, mobile banking and internet banking negatively and insignificantly influences financial inclusion in the banking industry in Kenya. This indicates that agency banking, mobile banking and internet banking negatively affects financial inclusion in the banking sector in Kenya by 0.757, 0.596 and 1.701 units respectively. This also indicates that the three forms digital financial services (agency

banking, mobile banking and internet banking) adversely affect financial inclusion in the banking industry in Kenya. The study also found that agency banking, mobile banking and internet banking have a weak negative correlation with financial inclusion. Thus, an indication that agency banking, mobile banking and internet banking move in the opposite direction and has a week effect on financial inclusion the banking sector.

As such, Mbutor and Uba (2013) established that growing financial inclusion improves the effectiveness of monetary policy however; the number of bank branches had the wrong sign because by opening branches, banks mainly pursue profits but not financial inclusion. Thus, opening more branches is a policy objective and there may be clusters of branches, which are under-utilized in numerous locations. Ranjani and Bapat (2015) found that to be able to achieve financial inclusion, it is not enough if bank accounts are opened and by simply having an account with a bank did not result in the borrowers using banking services and that they preferred to deal with institutions that allowed more flexible services than the bank. However, Andrianaivo and Kpodar (2011) found that the spread of mobile phones strengthens the influence of financial inclusion on economic growth, particularly in countries where mobile financial services take hold.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five summarizes research findings, the conclusions of the study and the recommendations for policy and practice. The chapter also presents the limitations of the study and the suggestion for further research.

5.2 Summary

This study sought to examine the effect of digital finance on financial inclusion in the banking industry in Kenya. The study adopted the theory of financial innovations, the innovation acknowledgment model and the dispersion of development hypothesis to explain financial inclusion and digital finance adoption respectively. The study considered three digital financial services consisting of agency banking, mobile banking and internet banking to established their effect on financial inclusion proxied using credit penetration. This study targeted 13 commercial banks, which offered all the three digital finance services including mobile banking, agency banking and internet banking but only got complete data from 12 commercial banks, which were fully functioning.

The descriptive statistics results revealed that financial inclusion had a mean value of 0.283 and whereas the average number of agents in terms of natural log was 9.928. The results further established that average mobile banking transactions in terms of natural log was 16.02 while the average internet transactions in terms of natural log was 11.502 respectively. The results of correlation analysis established that agency banking measured

by the number of agents, mobile banking measured in terms of mobile banking transaction and internet banking measured in terms of the total internet banking transactions had a negative correlation with financial inclusion in the banking sector in Kenya.

The regression results established that the independent variables (agency banking, mobile banking and internet banking) explained only 4.4% of the variation in the dependent variable (financial inclusion). The results of the regression coefficients found that there is an insignificant negative relationship between agency banking measured in term of the number of agents, mobile banking measured by the number of mobile banking transactions and internet banking measured in terms internet banking transactions with financial inclusion in the banking industry in Kenya. Finally, the ANOVA results established there was no significant relationship between digital financial services and financial inclusion in the banking industry in Kenya.

5.3 Conclusions

The findings of the study found that agency banking, mobile banking and internet banking negatively and insignificantly influence financial inclusion in the banking industry in Kenya. This study concludes that agency banking, mobile banking and internet banking negatively affects financial inclusion and that the three forms digital financial services (agency banking, mobile banking and internet banking) adversely and insignificantly affect financial inclusion in the banking industry in Kenya.

Overall, the study concludes that digital finance does not have a significant effect on financial inclusion in the banking sector in Kenya. Thus, banking institutions adopt digital financial services to lower operating cost associated with opening and operating more

branches to improve their profitability and financial performance and not to foster financial inclusion. Additionally, the study observes that the adoption of digital financial services is more of a competitive strategy and policy used by banking institutions to increase their bottom lines and not a financial inclusion strategy.

5.4 Recommendations for Policy and Practice

The study concluded that digital financial services have an insignificant effect on financial inclusion in the banking sector in Kenya. As such banking entities charge fees and commission on digital finance services, which may discourage their usage by customers. This study recommends that to ensure the usage and adoption of digital financial services bank should create more awareness of such services and offer them at lower cost to enhance the usage of such services.

The study has observed that digital financial services do not foster financial inclusions hence the conclusion that digital financial services are aimed at lowering operating cost and improving banking institutions profitability. This study recommends that the Government of Kenya and the various policy institutions in Kenya should come with policy structure, which will enhance financial inclusion since financial inclusion promotes financial intermediation and economy growth.

5.5 Limitations of the Study

This study used a sample of 13 commercial banks, which had adopted all the three digital financial services considered by the research. However, complete data was obtained from 12 institutions, which were operation. The findings are limited to the sampled banking institutions in Kenya.

Digital financial services are also a new financial innovation, which is yet to take root in Kenya, and only 13 commercial banks have adopted all the forms since 2011. Most commercial banks only have adopted one or two of the three forms. Thus, this study is limited to five years from 2011 to 2015 which were considered for the research.

5.6 Suggestions for Further Research

This study combined three forms of digital finance to establish their effects on financial inclusion in the banking sector in Kenya. However, the adoption of the three forms had been varying with the earliest forms of digital finance being mobile and internet banking while agency banking was introduced in 2010 in Kenya. This study suggests an independent examination of each form of digital finance on financial inclusion in the banking industry to establish their individual effects.

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APPENDICES

Appendix I: List of Commercial Banks in Kenya as at 31st December 2015

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

Source:CBK 2015 Report

Appendix II: List of Commercial Banks offering Digital Services as at 31st December 2015

1. National Bank of Kenya Ltd
2. K-Rep Bank Ltd
3. Kenya Commercial Bank Ltd.
4. Jamii Bora Bank Limited
5. Gulf African Bank Limited
6. First Community Bank Ltd
7. Family Bank Ltd.
8. Equity Bank Ltd.
9. Diamond Trust Bank Kenya Ltd
10. Co-operative Bank of Kenya Ltd
11. Consolidated Bank
12. Chase Bank (K) Ltd.
13. Bank of Africa

Source: CBK 2015 Report

Appendix III: Data Collection Sheet

Bank	Year	Total Loans	GDP	Total number of Agents	Total mobile banking transactions	Total internet transations