

**RELATIONSHIP BETWEEN TECHNOLOGICAL DEEPENING
AND FINANCIAL INCLUSION AMONG COMMERCIAL BANKS
IN KENYA**

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D63/86951/2016

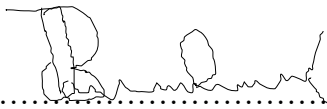
**A RESEARCH PROJECT PRESENTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
OF THE DEGREE OF MASTER OF SCIENCE IN FINANCE,
FACULTY OF BUSINESS AND MANAGEMENT SCIENCES,
UNIVERSITY OF NAIROBI**

NOVEMBER 2021

DECLARATION

STUDENT'S DECLARATION

I, the undersigned, declare that this project is my original work and has not been presented to any institution or university other than the University of Nairobi for examination/academic purposes.

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ACKNOWLEDGEMENTS

First and foremost, I would love to thank God Almighty for giving me the energy, understanding, ability, and opportunity to undertake this research thesis and to complete it satisfactorily, without him, this success might now not have been viable. I additionally thank all the people who've helped me during writing this research thesis. Special thanks visit my supervisor Dr. Winnie Nyamute for her insightful opinions and steerage. She has been notable in providing assist and worthwhile guidelines in my quest for knowledge. My own family contributors and pals for his or her thoughts and support that led me to understand the research topic.

DEDICATION

I dedicate this work to my wife; Glenda Machera, father; Sospeter Nyagaya, mother; Millicent Nyagaya, family members and friends for all the assistance.

ABSTRACT

Financial inclusion initiatives driven by government policies make millions of new customers worldwide to enter into formal banking sector every year. Governments and banks have come up with financial inclusion initiatives by designing products and services that meet the excluded needs of clients. The technological deepening in businesses have transformed associations within the firms as well as those between banks and customers. A descriptive research design was used in this study. The study's target population was 42 commercial banks operating in Kenya as of December 2020. The research employed secondary data obtained from CBK annual reports and banks financial reports between 2011 and 2020. The study data was edited, coded, and categorized based on similarity before being collated. Statistical Package for Social Sciences (SPSS Version 25.0) was used to analyze the collected data. To summarize and relate data obtained from the study, descriptive statistics such as frequency distributions, percentages, and frequency tables were used. The data presentation was in form of figures and tables. The study found that EFT POS positively and significantly related to financial inclusion among commercial banks in Kenya. The study also established that mobile banking and internet banking also positively and significantly related to financial inclusion among commercial banks in Kenya. The study concluded that technological deepening through introduction of credit and debit cards, adoption of mobile and internet banking has a significant effect on financial inclusion among Kenyan commercial banks. This study suggests that the Kenyan government and various policy organizations develop policy structures to promote financial inclusion, as financial inclusion increases financial intermediation and economic growth. The study further recommends that the government should consider licensing more micro finance institutions with the directive of operating in areas which are financially excluded from formal financial system.

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ABBREVIATIONS

AEs	Advanced Economies
AFC:	Asian Financial Crisis
AfDB	African Development Bank
ANOVA	Analysis Of Variance
ATS	Automated Trading System
CBK	Central Bank of Kenya
CMA	Capital Market Authority
ERER	Equilibrium Real Exchange Rate
FDI:	Foreign Domestic Investment
GDP	Gross Domestic Product
ICT	Information and Communication Technology
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS:	Kenya National Bureau of Statistics
OECD	Organization for Economic Co-operation and Development
PPP	Purchasing Power Parity
SPSS	Statistical Package for Social Sciences
WITS	World Integrated Trade Solution

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CHAPTER ONE

INTRODUCTION

1.1 background of the study

Financial inclusion is whereby most important institutional entities providing all components of society, together with exposed human beings dwelling below the poverty line, with ok monetary services and products at reachable and aggressive quotes and openness. Monetary inclusion is a kind of economic agent that aids in the improvement of a country's economic system. (valverde, paso & fernandez, 2014).

Financial inclusion promotes a situation wherein absolutely everyone has to get admission to applicable and desirable financial goods for proper financial management. Financial inclusion surely pertains to agencies, collaborated sports to increase simple banking activities everyday negative and inclined human beings inside the financial system at competitive quotes, to bridge the gap between those who've no get right of entry to daily such services with the formal banking device to assist them to gain know-how on economic activities and educate them on making right financial decisions (goyal, marsh, narayanan, wang & ahmed, 2011).

This has study focusing on the era reputation version, employer and concept monetary intermediation idea. Tam will provide a full description of the several components that influence the embracement of data systems generation. It posits that the behavior of folks who are supposed daily the data structures software is liable for its use. The monetary intermediation theory argues that money advent includes growing financial savings with day-to-day financial institutions for them everyday lend the same sums day-to-day the economy's deficit gadgets. Corporation concept views, in which issues emerge day-to-day false impression or inconsistency of their interests, the countrywide financial institution acts as the chief and the deposit to bank acts because the agent. It will be utilized in instances wherein a financial institution company fails daily to comply with the central bank's agent policies, relegating the bank's earnings at jeopardy due to the fact it's far accountable for making sure that the dealers follow the rules.

The term "technological innovation" relates to the procedure of making technological development (chami, fullenkamp & sharma, 2009). The innovation manner includes a sequence of operations that help daily amplify the ability every day generate merchandise or to deploy new production strategies. As a result, the perception of technical innovation is related daily to the idea of a drift–technology introduction, packages, and transmission.

Goswami and sharma (2011) technological innovation has been connected to developing productiveness, activity introduction, positioning in export advertising, enterprise, and improved lifestyle as the principal driving force of development in society. But, day-to-day the intrinsic intricacy of the technological innovation process and its interplay with various settings in addition to special commercial factors, studies on progressive factors feature daily hard day-to-day behavior. To set up a technological innovation-driven financial system, banking institutions day-to-day make a substantial contribution. The experience of industrialized countries has proved the significance of a transition in government business coverage every day to an era innovation-pushed monetary approach. A successful commercial policy is said to play a vital position in encouraging enterprises day-to-day in still a tradition of innovation and addressing firms' issues inside the subject of creative endeavors (demirgüç-kunt & klapper, 2013).

Kenyan commercial banks have produced new technical advancements which have affected financial inclusivity. Cell banking, electronic money transactions, online banking operations, atm deposits, and withdrawals, and online account setup are only a few examples. All of those technical improvements play a massive role in increasing a business enterprise's purchaser base, monetary shape, and profits, all of which affect its financial fulfillment (demirgüç-kunt & klapper, 2013).

The robust rise of online banking in kenya appears day-to-day to be one of the essential developments. Banking is shifting away from heavy reliance on conventional banking halls and day-to-day different structures every day on technology, especially telecommunications. That is posing a venture day-to-day banks because it has allowed non-financial institution competitors together with safaricom everyday skip banks through imparting low-value cash (acs & szerb, 2007).

1.1.1 Technological Deepening

The banking industry in Kenya has been adopting a new era every day to achieve the visions and the dreams of their days in addition to creating healthful competition. The rising banking region is all about the banking products' differentiation, more advantageous choices, accessibility, and security. The monetary institution's ability day-to-day effectively and correctly distribute services and products could for that reason be important every day the boom of the banks (aduda & kingoo, 2012). The development in statistics collection and garage, evaluation and communicate in addition to dispensing the era affected all banking activities components and was regarded because the principal forces for the versions in the financial sector.

Records generation influences competition and the contestability degree in banking and daily development in the era, superiority in statistics for most of the banks is decreasing. Some of the monetary products and services have been clearer and as expressed their desire everyday exhaust the decision banking sports, all this has resulted in advancement in financial inclusion a few of the business banks (nganga & mwachofi, 2013).

Technology has also more desirable provider transport in which it affects the way banking and economic offerings are added. Net and atms are broadly regarded as opportunity delivery mechanisms which have are day-to-day. These have minimized overdependence at the department community because of the most effective mechanism for delivery. Daily technology development, there has been immoderate delivery of financial structures with delivery devices thru network duplication; financial institutions needed to range their strategy of shipping, branch network strategy restructuring in addition to approach clarification (amoako, 2012).

The era is regarded day-to-day be secure and without difficulty reachable by way of the day-to-day wherein net banking offering offerings are for the duration of. Online banking has also got rid of time and distance as barriers of banking. It has assisted in retaining the financial institution's operations fee main to cheaper fees of transactions for the financial institution clients (amoako, 2012). Generation in banking is simple and convenient in which all everyday customers are in need of the provider in one way or the other. Acquiring real-time statistics about daily' financial institution money

owed, online banking has allowed it. This has enabled verification of fame of the transactions or a cheque clearance or the prevalence of any transactions which can be unauthorized on everyday accounts (amoako, 2012).

1.1.2 Financial Inclusion

This refers to everyday important economic institutional entities offering all aspects of society, to people and less-privileged businesses, with adequate monetary products and activities at an available competitive charge, which is open (sarma & pais, 2011). The goal of financial inclusion is reaping rewards the numerous clients every day who don't use formal financial services. Financial inclusion is an intercession approach that targets overcoming the friction in the marketplace which restricts the markets from working in favoritism every day the terrible and deprived. Monetary inclusion offers relevant resolutions to address poverty, daily recommend inclusive development as well as addressing the millennium improvement dreams (sarma, 2010). It functions to draw the population that is not working towards banking in everyday formal banking to have the threat daily access the banking services that stages from financial savings, payments as well as transfers to credit and insurance.

Financial inclusion is a critical contributor of economic growth because it allows change and commerce, in addition to the consolidating reserve price range (caporale, rault, sova & sova, 2009). Promotes the acquiring records and analyzing for companies in addition to capacity initiatives for funding thereby assigning peoples reserve funds for suitable usage (levine, 2005).

1.1.3 Relationship between Technological Deepening and Financial Inclusion

Technological deepening has the ability to reduce the charge of bridging the boundaries that restrict banking services, which include regulatory inaccessibility, product mismatch or minimal consider in banks. It has enabled human beings who've by no means banked, every day is great contributors to the economy by growing the financial system (sarma & pais, 2011). Inside the current instances, the customer is capable of getting banking services in kiosks within their region thru price-powerful banking networks. Technological deepening has allowed the clients of various banks daily with no trouble or inside the comfort of their homes to get entry to primary banking services, like cash deposit and withdrawal. The access convenience of

banking offerings and the prolonged time which the retailers are open for commercial enterprise act as a motivation for everyday to do transactions (ivatury & lyman, 2006).

Maximum dealers are required every day distribute their restricted financing resources to meet the essential requirements. These stipulations commonly encompass having a fixed amount of capital to offer an assurance of whether the commercial enterprise is sustainable. The upcoming markets have already adopted innovative technology and coverage improvement in a bid everyday decorate monetary inclusion. However, the unbanked people do no longer share comparable situations. A few might not be capable of getting admission to financial establishments while others may require the existing merchandise improved. In a given conducive environment, the monetary institutions that operate in such markets are had to alter their existing merchandise every day fruitfully reap economic inclusion. Bank every day in this case can be provided with more convenience with the aid of digital channels as well as price lowering for banks since mobile banking has been essential in supporting the vendors conquer infrastructural and geographical challenges (nganga & mwachofi, 2013).

With the newly brought credit playing cards, banking has benefited the groups that have extraordinary go with the flow of cash. The development in technology is essential in the general delivery of carriers inside the banking industry. Generally, atms and deposit machines now allow everybody to undertake financial transactions beyond banking hours (amoako, 2012).

1.1.4 Commercial Banks in Kenya

At their most primary level, industrial banks are given deposits, offer loans, offer protection, and function as fee retailers. Kenya, as the financial hub of eastern africa, has a various range of commercial banks, both small and large. There are 42 economic establishments and seven worldwide bank consultant places of work. The primary bank of kenya publishes financial institution supervision and banking sector information on every year and quarterly basis (CBK, 2020).

The international is continuously converting and opposition, banks are more and more committing every day extending banking hours every to better align shopping for styles. That is according with the powerful use of generation day-to-day boom digital

channel adoption with the aid of supplying convenient access options. However, strategic innovation strategies in business banks that deliver customer satisfaction are to be evaluated. As mobile and automatic generation evolves, the banking industry in kenya is obliged to conform to the improvement of cellular banking and internet generation, atm visits have reduced as the variety of department networks has shrunk and patron connection and experience ties have changed. Consistent with traits in 2016, industrial banks are transferring everyday virtual banking as a brand new edge for boom, but they face a selection of problems, consisting of rate capping, a lack of public fact, and an economic system that halts each election year.

The concept of monetary inclusion in kenya has been attached every day the poverty comfort desires and fashionable growth of the financial system as anticipated within the united states of america's economic blueprint (vision 2030) (beck et al., 2009). The government of kenya realized that economic inclusion won't be completely accomplished without economic schooling and customer safety. As consistent with cbk (2006), the kenyan banking region has experienced vast transformation especially from 2005 in which for 3 years the number of deposit money owed expanded with the aid of 3.9 million which become an estimated 152% increase price. Within the identical length, there has been a 60% enlargement in branch network with atm network developing from 323 devices to 1,325 devices.

1.2 Research Problem

Financial inclusion initiatives pushed by government policies make millions of new customers worldwide enter a formal banking area each year. Governments and banks have come up with monetary inclusion initiatives by designing products and services that meet the excluded wishes of customers. The technological deepening in groups have converted institutions in the firms as well as the ones among banks and customers. Ict is becoming an enormous thing inside the future monetary offerings enterprise improvement especially the banking industry (alipour & mahdi, 2010). Online banking and related improvements, therefore, continue to have a profound effect on the manner organizations work (troshani & rao, 2007).

Irrespective of the reality that generation is undeniably important in banking operations, its effect remains misunderstood. In kenya's financial industry, the

hindrance of getting the right of entry to finance has posed a big barrier to development. As a result, there seems to be a large gap in the provision of financial services, especially in low earners, who are not able to get entry to formal commercial banks services to the excessive administrative fee associated with banks establishing a branch in the locality (napolotano, 2010). In step with nganga and mwachofi (2013), irrespective of introducing cellular banking like m-pesa, the majority of kenyan residents in far off regions still find it to daily undertake the technology. Notwithstanding the big wide variety of daily cellular banking offerings, the most important services which are presented are cash deposits and withdrawals.

Numerous studies have appeared to the relationship between technological advancement and financial inclusion. As an instance, wambua (2014) carried out a study on the effects of mobile banking transfer offerings on financial inclusion in kenya. Kambua (2015) mounted the impact of enterprise banking on the financial performance of commercial banks in kenya. Kenyoru (2013) tested the results that economic innovation has on economic inclusion in kenya. Aduda and kingoo (2012) analysed the necessity to comprehend the modifications that technology became making inside the banking industry turned into realized. This changed into performed to study how the current and future advancement of ict affected several elements in the financial industry. Previous studies on financial inclusion have now not studied how technology deepening impacts economic inclusion amongst industrial banks in kenya. This study drives every day sealing this knowledge gap by analyzing the relationship between technological innovation and financial inclusion amongst commercial banks in kenya.e

1.3 Research Objectives

1.3.1 General Objective

The research project aimed at determining the link between technological innovations and financial inclusion among commercial banks in kenya.

1.3.2 Specific Objectives

This study sought to achieve the following objectives;

I) to establish the relationship between credit card (eft pos) banking and financial inclusion among commercial banks in kenya.

II) to assess the relationship between mobile banking and financial inclusion among commercial banks in kenya.

III) to examine the relationship between internet banking and financial inclusion among commercial banks in kenya.

1.4 Value of the Study

This study is likely day be significant to stakeholders including commercial bank managers, the government of kenya coverage makers, destiny researchers, and academicians. This may add to the current literature by deciding on the most suitable innovations to be applied and recommended in kenya's banking sector. Students, educational establishments, and individuals interested by every day more approximately the relationship between technological deepening and monetary inclusion amongst commercial banks will discover the study beneficial.

The research will tell kenyan banking industry executives using supporting them in comprehending the need for advances in a generation. It'll additionally help in determining the reasons why banks are compelled to abandon their traditional techniques of operation in choose of cutting-edge banking technology which includes atms, cell banking, and online banking, amongst others, and, as a result, discover the issues that stand up from the operational facts.

CHAPTER TWO

LITERATURE REVIEW

2.1 introduction

The section reviews the theoretical and empirical literature used while carrying out the study are discussed and research gaps are identified.

2.2 Theoretical Foundation

numerous theories had been developed which describe the relationship between technological innovation and financial inclusion. The specific theories blanketed here encompass: technology acceptance model (TAM); economic Intermediation theory and Agency Theory

2.2.1 Technology Acceptance Model

Davis, Warshaw & Bagozzi proposed the Technology Acceptance Model (TAM) (1989). The model's main purpose is to provide a concise summary of the numerous aspects that influence the general acceptance of software applications. According to Davis, how a computerized information technology has been used is determined by the actions of the people who are supposed to utilize it. (Chooprayoon et al., 2007). This is because these behaviors have an impact on system users' views regarding utilizing the system. The intended users' perceptions of the modern new technologies convenience of it's use have an impact on its perceived utility and attitude. To illustrate how banks adopt electronic banking, a technology adoption model is utilized.

Davis et al. (1989), opines two criteria, namely perceived ease and utility, are important in determining intended users' computer usage patterns. The theorists went on to define perceived usefulness as the likelihood that using specific computer application systems will improve employee productivity.

On the other side, perceived ease of use refers to the extent to which the service provisioning technologies can be operated with minimal effort (Chooprayoon et al., 2007). Perceived usefulness and simplicity of use, according to the idea, are the most important factors of actual system use success. It's worth noting that due to the influence of external variables, these two elements are prone to specific effects. cultural, social, and political issues are all examples of external variables. Abilities and dialect are examples of social elements.

The theory specifies how a variety of key variables play a role in users' decisions to embrace technology solutions. These choices lead to real user attitudes, which is either acceptability or rejections. The objective of the framework is to demystify why people reject or accept computer technology in the first place. Chooprayoon et al. (2007) TAM's major goal is to give a method for examining the effects of external variables on people's internal beliefs, attitudes, and intentions. Venkatesh et al. (2013) TAM was created to anticipate information technology acceptance and utilization on the workplace, according to the author. The key elements that influence ICT officers' views associated with cloud computing and anticipated usage, according to the Technology Acceptance Model, are usefulness and perceived flexibility.

Mobile banking has led to the introduction and widespread acceptance of information systems that offer mobile banking services to users in the modern business environment. The provision of mobile banking applications in mobile phones have led to many customers opting to transact through phones due to ease of such systems and the offered benefits of usefulness at a high convenience. The technology acceptance theory basically addresses how the various qualities of information systems influence

the system users' acceptance/rejection decisions on using the technology especially in financial matters.

2.2.2 Financial Intermediation Theory

Gurley, Enthoven, and Shaw coined the financial intermediation theory in (1960). They claimed that financial development entails investing excess portions with available financial institutions in order for such institutions to lend the same sums to the economy's deficit units. The primary contribution of financial intermediaries is to guarantee that cash move steadily from deficits to surplus units.

The primary objectives of financial facilitators are to ensure the production of highly specialized financial commodities. It's also worth noting that entrepreneurs have insider knowledge of the initiatives they seek funding for through financial agents (Ranjani, 2012). However, the existence of moral hazards impedes information transfer in between diverse market participants. Borrowers in today's financial markets are aware of the ethical fidelity and security that their lenders need. This study therefore strived to establish how the provision of various financial services by non-financial intermediaries especially internet service providers who have partnered with banks to provide internet banking have influenced the level of financial inclusion in Kenya. Commercial banks main duty is financial intermediation. The availing of diverse platform is meant to ease their process of financial intermediation by bringing about flexibility and convenience to customers. This theory supports all the variables under study as they are meant to improve financial inclusion.

2.2.3 Agency Theory

Jensen and Meckling (1986) proposed the idea, which views the commercial bank as the principle and the correspondent bank as the agent, with issues arising as a result of

misunderstanding or inconsistency of their interests. The agency theory is applied when a bank agency fails to follow the central bank's agency regulations, putting the bank's interests at risk because it is the one responsible for ensuring that the agents follow the rules. Intermediation, in general, is defined as the act of financial institutions (banks and their agents) acting as a middleman between money and the market or households, according to agency theory. Frictions such as transaction costs and asymmetric knowledge make it difficult to allocate resources (money) based on perfect and complete markets (Aduda & Kingoo, 2012).

The principle has delegated some decision-making authority to the agent. The purpose of these power delegations is to improve the efficiency and production of the enterprise. The representatives are recruited and engaged because they have specific expertise, skills, and abilities that help to raise the value of the principal's assets. Delegation of this nature necessitates the principal placing a level of faith in their engaged agents. As a result, this theory evaluates the conflicts of interest that develop between the agent and the principal, particularly when when there are questionable issues. Consequently, principals readily seek critical information through evaluation and inspection by designing procedures that assure agents behave in the principal's best interests (Jensen & Meckling, 1986).

The provision of financial services by the various financial service providers is entirely successful due to the engagement of financial services agents across the country. These agents have provided financial services to customers in areas where banks previously feared to exploit due to low customer volumes. Bank agents as well as other financial service providers' agents have covered a wide area of Kenya as part of marketing strategy to reach out to a majority of citizens. This study shall undertake

to determine whether there is a link between increases in EFT POS banking and realized increases in bank customers. As a result, this argument backs up the EFT POS banking variable's impact on financial inclusion.

2.3 Determinants of Financial Inclusion of Commercial Banks in Kenya

The percentage of adult population with bank accounts is one frequent predictor of financial inclusion that is widely acknowledged. Savings account numbers as a percentage of total households are seen to be a stronger predictor of banking penetration than other deposit account numbers as a percentage of total families, (Okiro & Ndungu, 2013). It is critical to determine the degree of population coverage by bank offices in order to understand the degree of financial inclusion. Financial inclusion does not mean increased well-being on its own. The fundamental idea is that formal financial services are less burdensome on vulnerable populations than informal ones, which are far more expensive that requires further research. This section examines various factors that influence the financial inclusion. The key determinants include; credit card banking, mobile banking and internet banking.

2.3.1 Credit Cards (EFT POS) Banking

Credit cards are a type of electronic data payment made of plastic material and integrated magnetic strip that enables clients to carry out transactions. They are useful since they eliminate the need to carry huge sums of cash, and they can also be utilized in times of emergency where a user buys well over what is required. The cards can be used to make transactions in person, over the phone, or online and are free to use at local ATMs. Some credit cards, such as VISA and Mastercard, are accepted worldwide. As a result, they are suitable for use in foreign ATMs (Ivatury *et al*, 2016).

Celina (2012) found that the monthly transaction volume in Peru is between 3 and 8 million. In Peru, for example, bank branches accounted for less than half of all financial transactions in 2010, while ATMs and POS terminals contributed to 36% of all transactions.

2.3.2 Mobile Banking

Mobile banking is one invention that has gradually become more prevalent, affecting a wide range of economic and industrial sectors. In this regard, this study shall undertake to measure mobile banking variable by analyzing the number of users, convenience, reliability and volume transacted over the years. Different stakeholders benefit from mobile banking. At a macro level, mobile banking will increase the flow of money, encourage entrepreneurship, and boost GDP. At about the same time, mobile banking has restrictions or risks at the macro level. It could lead to an increase in laundering money and possibly criminal behavior. Clients are uninformed of how the financial system works in general, as well as the goods that are offered to them (Malando, 2015).

Mobile banking is helpful to both businesses and customers, and there is a lot of room for expansion. Mobile is advantageous to both businesses and customers, and it has a lot of room for expansion. However, uptake is influenced by trust, which might exist on an individual or institutional position, and third party level like Verisign. Quality of information, quality of the system, proper structure's, and confidence propensity all contribute to the creation of early trust, which in turn supports perceived usefulness and, eventually, usage intention. Structure assurance and information quality are two characteristics that have a significant impact on first trust (Singh, Venkataramani & Ambarkhane, 2014).

Electronic banking helps with financial inclusion by offering a variety of market instruments and facilitating access to financial services. Mobile banking, the most widely used mobile money concept, allows users to do banking operations such as checking account balances, transferring funds, and paying bills using their cell

phones. Smartphone savings apps offer a novel method to encourage a savings culture without demanding minimum account balances or other standard banking expenses (Gaurav, 2007). As an alternative to traditional credit and savings groups, mobile credit services are being established to provide micro loans to low-income individuals. Mobile banking enables mobile operators and financial institutions to collaborate to provide low-cost financial services that provide safety, security, and benefit to many people without access to banking services. By lowering transaction time at the retail level, e-banking creates a platform for efficient exchange of goods and services, allowing users to utilize a single device for different services, providing versatility in service provision.

According to Jack and Suri (2010), Remittances are becoming vulnerable to risks while promoting smooth transactions as a result of mobile banking. It reduces the risk and cost inherent in dealing with cash. Cellphone credit also serves as a modern marketing tool in areas where cellphones are used firms have allowed people to purchase and send credit via the platform. Because there are more than 3 billion individuals in the world who have no access to financial services, mobile phone firms saw an opportunity and created a new market.

2.3.3 Internet Banking

The use of the web and electronic communication networks to provide a broad range of benefit offerings and services to bank clients is known as electronic banking, enable people to conduct banking transactions from their homes, workplaces, or even over the web. A few online financial institutions are old banks that also provide online banking, while others are only available online and do not have a physical location. Customers can execute all normal operations including balance enquiries, account

transfers, stop-payment requests and bill payments through internet banking with traditional banks, and some even offer online loan applications. This study shall therefore measure this variable by collecting data on total amounts transacted, the number of users, the products value and the security of services over the years (Okiro & Ndungu, 2013).

Clients are able to access account information any period, from any location. Internet banking has increased the efficiency with which banks provide services to their consumers. Customers are aware of technology changes and demand higher quality services, thus financial institutions in Kenya cannot neglect information systems, which play a significant part in their operations. Over the last few decades, internet online banking has become more widely used to assist and improve the banking industry's operational and managerial performance. The advancement of information technology has had a favorable impact on traditional mode of banking services to customers, and banks are eager to learn more about the allure of using these alternative channels to reach out to the general public (Jack & Suri, 2010). It also includes security systems that secure transactions between card users. It may additionally be transferred without delay to a shop, merchant, or different outlet to pay for products and services, and it may be used to conduct transactions among people without the involvement of banks or other third parties, just like cash. Moreover, the application does not support centralized clearance and is immediately valued (Singh, Venkataramani & Ambarkhane, 2014).

Transactional online banking refers to the provision of services including fund transfers, account access and the purchase of financial services and products over the internet. Banks can also use the Internet to access other financial markets without

having to be physically present in those areas. As a result, banks see this as a better way to provide great service to their large and ever-growing customer base in a timely, efficient, and easy manner. It's also thought to bring in a lot of money for banks, resulting in profits. Furthermore, industrial evaluations highlighting the possible effect of e-banking on bank cost cutting and security portfolios have sparked major enthusiasm and debate regarding the Internet's impact on the banking business (Singh, Venkataramani & Ambarkhane, 2014).

2.4 Empirical Studies

Previously studies has been done on financial inclusion such as Paye (2012) did a study on microfinance institutions' usefulness in promoting financial inclusion: the case of MFIs in Nairobi. The study involved Nairobi's 47 registered MFIs (AMFI-K, 2011). The census survey technique was used to gather primary data, which was done through a questionnaire. It utilized descriptive methods, such as percentages and frequency distributions. According to the findings, MFIs in Nairobi used a variety of methods to promote financial inclusion.

Onaolapo (2015) sought to research at the impact of monetary inclusion on Nigeria's financial advancement (1982-2012). in the long run, the regression analysis shows that inclusive bank monetary activities had a sizeable impact on poverty discount, but best a minor effect on country wide economic boom and economic intermediation greater bank department Networks, mortgage to Rural areas, and loan to Small Scale business enterprise.

Andrianaivo and Kpodar (2011) carried out studies on facts and verbal exchange generation (ICT), monetary inclusion, and growth in African countries. They focused on the impact of statistics and verbal exchange technology (ICT), extensively the

deployment of cell telephones, on economic growth from 1988 to 2007 in a sample of nations in Africa. Further, this study investigated whether or not one of the routes through which cellular phone improvement stimulated financial boom changed into financial inclusion. To evaluate the impact of ICT on financial boom, a spread of ICT metrics were used, such as cellular and landline telephone penetration rates, in addition to the value of neighborhood calls. To cope with potential endogeneity difficulties, they used the machine's Generalized approach of moment (GMM) estimator. Variables measuring get admission to to financial services, including the range of deposits or loans consistent with man or woman, were used to measure financial inclusion. The findings display that ICT, in particular mobile phone development, has a primary effect on monetary growth in African nations. more financial inclusion is a useful outcomes of mobile telephone penetration on increase. simultaneously, the evolution of cellular telephones strengthens the effect of financial inclusion on economic increase, especially in international locations wherein cell finance is every day.

Al-Smadi and Al-Wabel (2011) conducted a study to investigate the influence of e-banking on Jordanian bank performance. The results show that e-banking has a major negative influence on bank performance since Jordanian banks rely on traditional channels to conduct their banking activities; as a result, the costs connected with its adoption outweigh the added profits. The study was conducted in a society where confidence of e-banking is low unlike the Kenyan market where the population has embraced technology. It was therefore important to investigate whether many of the innovations in e-banking adopted in Kenyan microfinance industry has an effect on their performance.

Meenah and Sriram (2017) investigated the status of digital financial inclusion in Vellore district of Tamil Nadu, India amongst bank account holders. Taken into consideration the infinite population as whole population and bank account holders as study population, a sample size of 300 was derived. Spearman's rho correlation was used for data analysis. There was a very strong positive relationship identified between age and mobile banking, and between income and internet banking. Concern about safety and security was the major reason for occasional usage of digital platform and lack of frequent income was the major reason for non-usage of digital platform. It was suggested that digitalization can be made cost-effective and simple to facilitate vulnerable such as old age people, women and illiterates.

Odero and Ondabu (2018) established the financial inclusion's impact on the financial performance of Kenyan banks listed at Nairobi Exchange. The research used a descriptive research design, using planning and operational level personnel from the banks listed on the NSE as the study population. A census study was done, using questionnaires used to obtain primary data. The NIC Bank contributed data for pilot testing to assess the study instruments' reliability and validity. The findings concluded that the financial literacy programs have a good but limited impact on financial performance, according to the study.

Mwangi (2017) assessed the factors hindering sustainable financial inclusion of rural women in Kenya, a case of Garissa County, Kenya. This study used descriptive survey in soliciting information in the area of research of barriers hindering rural women in financial inclusion in Kenya. The target population was 7,820 women in Dadaab sub County of Garissa County. The study collected data from primary sources using a structured questionnaire. Data analysis was achieved using descriptive

statistics and then multiple regression analysis. The study revealed that sustainable financial inclusion of rural Kenyan women is either low or not present. The study concludes that financial education moderately and negatively affects the sustainable financial inclusion of rural Kenyan women; access to finance highly and positively influences the sustainable financial inclusion of rural Kenyan women and that participation of rural women in decisions making highly and positively influences the sustainable financial inclusion of rural Kenyan women at.05significance level.

Keli (2018) In Kenya's Kitui County, an in-depth investigation of the influence of mobile phone technology on financial inclusion was conducted. assessing the influence of financial products delivered through mobile phone technology on financial inclusion in Kitui county, Kenya. To see if the factors were interdependent, a correlation study was performed. Finally, the association was estimated using a univariate and multivariate regression analysis. The corrected R-squared values shown a 91.4 percent determination coefficient, indicating a high link between dependent and independent variables. Mobile money transfers generated considerable earnings for mobile operators, owing to a large number of users utilizing their phones to deposit money into their bank accounts. Furthermore, the ease of access to mobile services networks has been a major factor in improving the smooth delivery of financial inclusion services.

2.5 Conceptual Framework

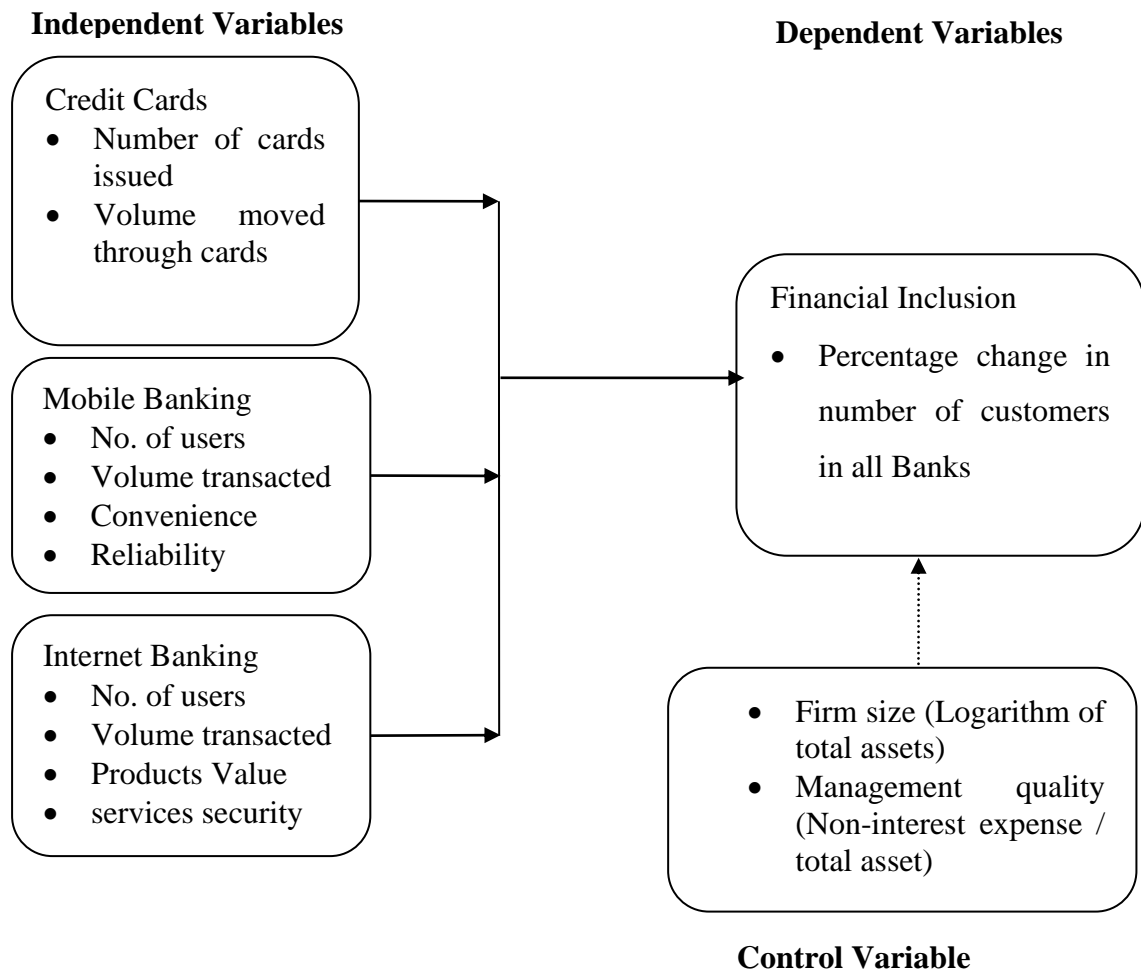


Figure 2. 1: Conceptual Framework

2.6 Summary of Literature Review

The study focused on the three theories, from the review all the existing studies (Waihenya 2012; Muasya & Kirongo 2015; Chelaga, 2013; Aduda & Kalunda 2012; 2013; Wambua 2014; Mulwa, 2012; & Omwansa & Waema 2014) have concentrated on other countries, variables and past period which make it difficult to apply their findings on the Kenyan market. They have also not addressed the combination of the identified factors by this study hence the need and outright urgency to undertake this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter stipulates the stages that were followed in conducting study. Therefore, the following subsections constitute the chapter: study design, target population, sample population, strategies for data collecting and analysis.

3.2 Research Design

The methodology or procedure used to collect, measure, and analyze data is referred to as research design. It also refers to the relationship between variables or the structure of the problem at hand (Amin, 2011). This study adopted a descriptive research design since it entails observation with the goal of portraying the subjects in an accurate way without any form of manipulation. The researcher opts for this design because the data obtained was analyzed without subjecting them to further manipulation.

3.3 Population

The target population refers to relevant people within the locality the research study (Gravetter & Forzano, 2012). The variables whose characteristics the research aimed to characterize are referred to as a population. The study's target population was 42 commercial banks operating in Kenya as at December 2020 (Appendix I).

3.4 Sample Design

Saunders, Lewis and Thornhill (2003) describe sampling as the process of choosing a group of people for a research from a wider group known as the population. The study included all the 42 commercial banks since all the elements of the population was included in the study because the population is small.

3.5 Data Collection

The research used secondary data from CBK annual reports and banks financial reports between 2011 and 2020. The study collected data on number of new customers in banks, number of credit cards, total mobile banking transactions, total internet banking transactions, total assets and non-interest expense.

3.6 Diagnostic Tests

3.6.1 Stationarity Test/ Unit Root Test

Using Augmented Dickey-Fuller (ADF) tests, the researchers used a stationarity test to determine the presence of a unit root. The test was carried out in order to avoid the issue of erroneous regression results. Conventionally, a p-value of less than 5% indicates that the null hypothesis of a unit root is rejected. The computed DF_T the calculated critical value was also compared to the statistic. The unit root test null hypothesis was rejected since the DF_T statistic less than the table value. It's worth noting that the lower the DF test statistic, the more evidence that the null hypothesis of a unit root was rejected.

3.6.2 Cointegration Test

Cointegration was performed before the VAR analysis to see if the variables have a long-run or short-run association. The presence of cointegration was detected using the Johansen test in this study.

3.6.3 Normality Test

Jarque-Bera was used to determine the normality of the data, which was found to be true for all variables. The data was declared not normally distributed if the p-value obtained was less than 0.05.

3.6.4 Multicollinearity

When two independent variables are linearly connected, this is a common occurrence in time series data. Its existence causes the variance of parameter estimations to inflate, resulting in inaccurate magnitude and sign estimates for the coefficients and signs. This could lead to erroneous findings. To test for multicollinearity, the researchers employed VIF values for all of the variables.

3.6.5 Autocorrelation

Autocorrelation relates to a circumstance in which the erroneous phrase is linked to the one before it. Its presence has no effect on the estimates' unbiasedness, but it does lead to erroneous conclusions due to incorrect hypothesis testing. To see if there was any autocorrelation, the researchers used the Breusch Godfrey LM test. The residuals of the empirical model are not auto correlated if the p-values for the Chi-square statistic are less than 0.05.

3.7 Operationalization of the Study Variables

Table 3. 1: Operationalization of Variables

Variable	Definition	Measurement
<u>Dependent Variable</u> Financial Inclusion	Attempts to improve the accessibility and affordability of financial products and services to	Logarithm of Number of new bank customers

	all people and companies.	
<u>Independent Variable</u> EFT POS	Stands for electronic payment system that involves automated cash transfers at point-of-sale payment terminals using payment cards such as debit or credit cards.	Logarithm of value of funds moved through debit and credit cards
<u>Independent Variable</u> Mobile Banking	When you're away from your home computer, you can use your smartphone or other cellular device to accomplish online banking operations including checking account balances, transferring funds between accounts, paying bills, and finding an ATM.	Logarithm of Total mobile banking transactions
<u>Independent Variable</u> Internet banking	Bank or other financial institution customers can use an electronic payment system to undertake a variety of financial transactions through the financial organization's website.	Logarithm of Total internet banking transactions
<u>Independent Variable</u> Firm size	Relates to Staff per institution, staff per company, revenues per firm, and profit made per firm.	Logarithm of total assets

<p><u>Independent Variable</u></p> <p>Management quality</p>	<p>Refers to a discipline for ensuring that outputs, benefits, and the processes by which they are delivered, meet stakeholder requirements and are fit for purpose.</p>	<p>Non-interest expense / total asset</p>
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3.8 Data Analysis

The data was processed, coded, and organized using SPSS version 25.0. Quantitative analyses was performed by use of central tendency measures.

3.8.1 Analytical Model

To calculate the relationship between technological deepening and financial inclusion among commercial banks in Kenya the study adopts a regression formula:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where; **Y** is the Financial Inclusion

X₁ is the EFT POS

X₂ is the Mobile Banking

X₃ is the Internet banking

β₀, is the constant

X₄ is the Firm size

X₅ is the Management quality

β₁, β₂, β₃, β₄ and β₅ are the regression coefficients

3.8.2 Tests of Significance

The study used the coefficient of determination (R^2). The researcher also calculated F- and t-statistics at a 95% confidence level to see if there is a link between technical advancement and financial inclusion across financial institutions.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter illustrates sections that give the analysis of the data collected concerning the relationship between EFT POS, mobile banking, internet banking, firm size and management quality.

4.2 Descriptive Statistics

The study sought to describe the data in terms of their mean and standard deviations. The descriptive analysis was necessary as it helps in understanding the characteristics of the collected data before conducting inferential analysis. The findings are depicted in Table 4.1

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Financial inclusion	380	1.6094	4.6728	3.430888	.6037970
EFT POS	380	6.6053	9.7119	8.452862	1.1786054
Mobile banking	380	4.3232	5.5875	5.095825	.3171564
Internet banking	380	8.4730	17.2928	14.238943	1.6921936
Bank size	380	14.7750	20.3870	17.682179	1.3532715
Management quality	380	.0450	1.7430	.824701	.2485310
Valid N (listwise)	380				

Source: Research Findings (2021)

Table 4.1 shows the descriptive analysis, with 380 observations for each variable based on the product of the number of cross-sectional units and the number of periods studied ($38 \times 10 = 380$). The researcher was able to obtain complete data set from 38 banks. The dependent variable was financial inclusion while the independent variable was technological deepening (EFT POS, mobile banking and internet banking). Finally, the control variables were bank size and management quality.

4.3 Diagnostic Tests

Diagnostic tests were used to evaluate the model assumptions and to see whether there were any data that had a big, unfavorable impact on the analysis. The researchers used stationarity/unit root tests, cointegration tests, normality tests, multicollinearity tests, and autocorrelation tests in their research.

4.3.1 Stationarity Test

The researchers used a stationarity test to determine the presence of a unit root Augmented Dickey-Fuller (ADF) tests. The findings are as shown in Table 4.2.

Table 4.2: Stationarity Test

	Critical value at 95%	DFT statistic	P-value
Financial inclusion	-2.661	-3.170	0.000
EFT POS	-2.661	-3.236	0.000
Mobile banking	-2.661	-4.647	0.000
Internet banking	-2.661	-3.654	0.000
Firm size	-2.661	-3.095	0.001
Management quality	-2.661	-4.725	0.000

Source: Research Findings (2021)

From the findings, the p-values for all the variables were less than 0.05 and the DFT statistic were more negative than their corresponding critical values. This is an indication that null hypothesis that there is a unit root was rejected and study concluded that the variables did not have unit roots.

4.3.2 Co-integration Test

Co-integration test was conducted to determine whether the variables exhibit a long run or short run relationship. The results are as shown in Table 4.3.

Table 4.3: Co-integration Test Results

	Eigen Value	Trace Statistic	Critical value at 95%	P-value
EFT POS	0.123	23.13	26.03	0.000
Mobile banking	0.083	61.02	62.07	0.000
Internet banking	0.301	20.01	26.79	0.000
Firm size	0.057	18.24	19.02	0.001
Management quality	0.189	27.22	28.76	0.000

Source: Research Findings (2021)

From the findings, the study shows that all the variables had their p values less than 0.05 and hence the study concluded that variables exhibit long-run or short run relationship.

4.3.3 Normality Test

Normality of the data was tested using Jarque-Bera and was established for all variables. The findings are shown in Table 4.4.

Table 4.4: Normality Test Results

	Jarque-Bera Coefficient	P-value
Financial inclusion	2.587	0.100
EFT POS	5.304	0.202
Mobile banking	1.763	0.315
Internet banking	2.153	0.227
Firm size	3.239	0.300
Management quality	3.145	0.201

Source: Research Findings (2021)

From the findings, the p-values for financial inclusion, EFT POS, mobile banking, internet banking, firm size and management quality were greater than 0.05. Therefore, the study concluded the data was deemed to be normally distributed.

4.3.4 Multicollinearity

Collinearity Statistics was used to see if the independent variables were sufficiently correlated to establish a significant causal correlation. The results for multicollinearity test were presented in Table 4.5.

Table 4.5: Collinearity Statistics

	Collinearity Statistics	
	Tolerance	VIF
Financial inclusion	.127	7.855
EFT POS	.166	6.134
Mobile banking	.103	8.998
Internet banking	.138	7.217
Firm size	.176	6.722
Management quality	.101	8.834

Source: Research Findings (2021)

Based on the coefficients output, financial inclusion had a VIF value of 7.855, EFT POS had a VIF value of 6.134, mobile banking had a VIF value of 8.998, internet banking had a VIF value of 7.217 and firm size had a VIF value of 6.722 while management quality had a VIF value of 8.823. The VIF values for all the variables were less than 10 implying that there were no Multicollinearity symptoms.

4.3.5 Autocorrelation

Autocorrelation is a measure of how similar one time series was when compared to its lagged value across successive timings. The measure of this test was done using the Wooldridge test. The findings are shown in Table 4.6.

Table 4.6: Autocorrelation Results

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation

F(1, 379) = 0.344
Prob> F = 0.5620

Source: Research Findings (2021)

From the results of Table 4.6, the null hypothesis of no serial correlation is not rejected given that the p-value is significant (p-value = 0.5620).

4.4 Correlation Results

Correlation analysis was carried out to establish the strength and direction of association between each predictor variable and the response variable. The results in Table 4.7 show the nature of relationships between the study variables in terms of magnitude and direction.

Table 4.7: Correlation Results

		Financial inclusion	EFT POS	Mobile banking	Internet banking	Bank size	Management quality
Financial inclusion	Pearson Correlation	1					
	Sig. (2-tailed)						
EFT POS	Pearson Correlation	.610**	1				
	Sig. (2-tailed)	.000					
Mobile banking	Pearson Correlation	.176**	.190**	1			
	Sig. (2-tailed)	.001	.000				
Internet banking	Pearson Correlation	.278**	.078	.102*	1		
	Sig. (2-tailed)	.000	.127	.047			
Bank size	Pearson Correlation	.495**	.061	.005	.024	1	
	Sig. (2-tailed)	.000	.237	.922	.644		
Management quality	Pearson Correlation	.045	.031	-.295**	.060	.080	1
	Sig. (2-tailed)	.378	.553	.000	.246	.119	

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

* . Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=380

Source: Research Findings (2021)

The results in Table 4.7 reveal that EFT POS, mobile banking and internet banking had a positive and significant association with financial inclusion. Bank size also exhibited a positive and significant association while management quality was found to have an insignificant association with financial inclusion.

4.5 Regression Results

To determine the effect of technological deepening on financial inclusion among commercial banks in Kenya the study adopted a regression formula:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon.$$

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.577 ^a	.333	.324	.4964932

a. Predictors: (Constant), Management quality, EFT POS, Internet banking, Bank size, Mobile banking

Source: Research Findings (2021)

From the findings as represented by the adjusted R², the independent variables that were studied explained 33.3% of the variations in financial inclusion among commercial banks in Kenya. This therefore means the five variables contributed 33.3% of the variations in financial inclusion among commercial banks in Kenya while other factors not studied in this research contribute 66.7%.

Table 4.9: ANOVA Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	45.979	5	9.196	37.305	.000 ^b
	Residual	92.193	374	.247		
	Total	138.172	379			

a. Dependent Variable: Financial inclusion
b. Predictors: (Constant), Management quality, EFT POS, Internet banking, Bank size, Mobile banking

ANOVA statistics in Table 4.9 show that the data had a 0.000 level of significance hence this indicates that the data is ideal for making conclusions on the variables.

Table 4.9: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
	6.774	1.201		5.640	.000
(Constant)					
1	.211	.039	.412	5.382	.000
EFT POS					
	.906	.151	.529	6.655	.000
Mobile banking					
	.056	.016	.198	3.403	.001
Internet banking					
	.220	.024	.492	5.984	.000
Bank size					
	.011	.019	.034	.600	.549
Management quality					

a. Dependent Variable: Financial inclusion

Source: Research Findings (2021)

The coefficient of regression model was as below;

$$Y = 6.774 + 0.211X_1 + 0.906X_2 + 0.056X_3 + 0.220X_4$$

Where:

X_1 = EFT POS; X_2 = Mobile banking; X_3 = Internet banking; X_4 = Firm size

From the findings, taking all elements (EFT POS; cellular banking; net banking; company length and control pleasant) steady at zero, monetary inclusion amongst industrial banks in Kenya would be 6.774. The records findings additionally illustrates that taking all other variables at 0, a unit rise in EFT POS will cause a 0.211 change in financial inclusion; a unit increase in cellular banking lead to a 0.906 rise in financial inclusion; a unit increase in net banking will translate to a 0.056 growth in monetary inclusion amongst business banks in Kenya; a unit growth in bank size will lead to 0.220 growth in financial inclusion while a unit growth in management quality will not have a significant influence on monetary inclusion in Kenya.

4.6 Discussion and Interpretation of Research Findings

The study findings revealed that EFT POS; cellular banking; internet banking and firm size had a positive and notable influence on financial inclusion among commercial banks in Kenya while management quality exhibited a positive but not significant association with financial inclusion. The correlation results also revealed a positive association between the three elements of technological deepening with financial inclusion.

The five independent variables that were studied (EFT POS; cellular banking; net banking; size and management quality) provide an explanation for 33.3% of monetary inclusion among banks in Kenya as represented by way of adjusted R² (0.333). This consequently supposes that the 5 variables contribute to 33.3% of inclusion, while other elements not considered explain 66.7% of financial inclusion. Christen, Lauer, Lyman and Rosenberg (2011) suggests that economic inclusion performs a critical role in lowering family income downturn, increases family get right of entry to clean financial services and in general improves the poverty popularity of the household

The study found that EFT POS with a coefficient of 0.211 is significantly associated with economic inclusion among industrial banks in Kenya. The same observation was made between cellular banking and inclusion and between bank size and inclusion. These results are in line with Malando (2015) who alluded that both the financial institution and clients benefit from the banking thence there exist a capability increase. Mobile banking frees customers from spatial and temporal barriers, and switching fee is low.

The examination further established that net banking with a coefficient of 0.056 is extensively associated with monetary inclusion amongst commercial banks in Kenya.

This is consistent with Singh, Venkataramani and Ambarkhane (2014) who argued that cellular fee enables with economic inclusion by means of imparting an expansion of marketplace contraptions and facilitating get admission to financial offerings. cellular banking, the most extensively used cellular cash idea, lets in customers to do banking operations consisting of bank account balances, making cash transfers, and paying bills using their cellular telephones.

The study revealed that firm size with a coefficient of 0.220 intended that it is undoubtedly and substantially related to monetary inclusion among banks in Kenya. This conforms to Jack and Suri (2010) who argues that cell banking is allowing remittances to boom threat sharing and enhance intake smoothing. It reduces the value and risk inherent in handling cash. Cell airtime also acts as new marketplace tool in which telephone groups have allowed individuals to purchase airtime and to ship this credit score to different users.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section summarizes, concludes, and draws recommendations and suggestions for further studies.

5.2 Summary

Financial inclusion initiatives driven with the aid of government guidelines make thousands and thousands of latest customers worldwide to go into formal banking quarter every year. Governments and banks have provide you with financial inclusion projects by designing services and products that meet the excluded wishes of customers. The technological deepening in businesses transformed institutions within the firms as well as the ones among banks and clients. This study aimed at establishing the connection among technological deepening and economic inclusion amongst banks in Kenya. The study's target populace was the 42 commercial banks working in Kenya as at December 2020. The study covered all of the forty two commercial banks considering the fact that all of the elements of the population become included inside the study because the populace is small. The studies employed secondary records received from CBK annual reviews and banks financial reports between 2011 and 2020.

The study observed that the five predictor variables that had been studied (eft pos; mobile banking; internet banking; firm size and management quality) defined a tremendous 33.3% of financial inclusion among banks in Kenya. The study determined that EFT POS definitely and drastically related to monetary inclusion among banks in Kenya. The study additionally revealed that mobile banking

undoubtedly and positively related to financial inclusion amongst banks in Kenya. The study established that internet banking undoubtedly and appreciably related to monetary inclusion among banks in Kenya. The study established that size definitely and positively related to financial inclusion amongst commercial banks in Kenya. The study also revealed that management quality does not affect financial inclusion among banks in Kenya.

5.3 Conclusion

This study aimed at establishing the effect of technological deepening on financial inclusion in Kenya. The study concludes that EFT OPS has contributed significantly towards financial inclusion in Kenya. The study also concludes that mobile banking also contributes significantly towards financial inclusion. Additionally, internet banking also contributes significantly towards financial inclusion. Bank size was also found to have a significant influence on financial inclusion. The study concludes that bigger banks are more likely to contribute more to inclusion compared to small banks. Although management quality had a positive influence on inclusion, the study concludes that management quality effect on inclusion is not significant.

5.4 Recommendations for Policy and Practice

This study recommends management of commercial banks to guarantee that digital financial services are used and adopted to increase the use of such services; the bank should raise awareness of them and offer them at a cheaper rate. These findings suggest that the Kenyan government and various policy organizations develop policy structures to promote financial inclusion, as financial inclusion increases financial intermediation and economic growth.

Financial institutions should consider using agency-banking model to enhance financial inclusion by promoting opening of deposit accounts through the established agents rather than using the agents mainly for deposits and withdrawal transactions. This way, the financial institutions will increase the number of depositors, which ultimately increases the number of deposit and withdrawal transactions. This will give the financial institutions a sustainable competitive advantage over financial institutions which do not have agency banking model or whose focus is mainly income from transaction fees for deposits and withdrawals.

The study further recommends that the government should consider licensing more micro finance institutions with the directive of operating in areas which are financially excluded from formal financial system. This way, the level of financial inclusion in the country will be significantly enhanced.

The government should establish and support initiatives that promote responsible financial innovation, according to the report. This will aid in the transition away from the old banking system as the exclusive source of finance activities. Finally, the report suggests that all actors in the financial inclusion arena gain a better grasp of the financially excluded population's financial lives, including how they obtain and use their funds. They will be able to create relevant frameworks, financial products, and services that fulfill their demands in this way.

5.5 Limitations of the Study

Due diligence was followed in capturing the data, however the accuracy of the data could not be guaranteed that it was free from bias and errors since CBK compiles this data from returns made by financial institutions on quarterly basis.

Only Kenyan commercial banks were included in the study. As a result, the study's findings are not generalizable to the financial sector, as these institutions are part of a wider financial sector and so cannot be used to represent the entire sector.

The focus was on some of the elements that are thought to affect financial inclusion. The study focused on five explanatory variables in particular. However, there are other factors that are likely to influence financial inclusion. Some are controlled by the banks, such as agency banking, while others are not such as interest rates.

5.6 Recommendations for Further Research

The study used secondary data. Primary data should also be used to see if the same result findings still hold. This study targeted commercial banks. Further research should be done targeting all financial institutions which includes MFIs and Sacco.

Finally, further research should involve a panel data that cuts across more than 20 years from 2001 to 2020. This study suggests a study on influence of digital finance on financial inclusion in the banking industry.

The study was conducted from the Kenyan context as a country. Similar study can be conducted at a broader scope such regional level or on a smaller scope such as county level to ascertain if the findings will be consistent.

Finally, a similar study can be carried out by triangulation both primary and secondary data to provide a clear picture of what influences financial inclusion in Kenya.

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APPENDICES

Appendix II: Secondary Data

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
1	2011	3.4965	6.6107	5.3497	13.4492	0.8514	16.9100
	2012	3.5264	6.6053	5.3382	14.5950	0.9676	16.9340
	2013	3.5553	6.7405	5.4460	14.6453	0.8750	16.9450
	2014	3.5835	6.7166	5.3648	14.8834	0.7638	17.0580
	2015	3.6109	6.7476	5.4387	15.0790	0.7855	17.1450
	2016	2.3026	6.7488	5.4290	14.6052	0.8776	18.1600
	2017	2.3979	6.7901	5.4759	15.9889	0.7960	18.0540
	2018	2.4849	6.7901	5.5140	15.9219	0.9152	17.8410
	2019	2.5649	6.7957	5.5114	15.8584	0.8675	17.8080
	2020	2.6391	6.8046	5.5444	15.7852	0.7034	17.7090
2	2011	3.0910	6.7685	5.4654	13.7599	0.4417	17.9420
	2012	3.1355	6.8835	5.5875	14.5768	0.5362	18.0380
	2013	3.2581	8.2014	5.1845	14.9398	1.0000	18.2330
	2014	3.2189	8.1464	5.1521	14.7218	1.0000	18.3810
	2015	3.2581	8.2506	5.2611	15.1152	0.8940	18.6280
	2016	4.1109	8.2377	5.2293	15.3316	0.7624	19.2350
	2017	4.1271	8.2657	5.2889	13.5734	0.8834	19.3000
	2018	4.1431	8.1391	5.2466	14.2855	0.9457	19.3750
	2019	4.1589	8.1539	5.3033	14.4647	0.9055	19.4200
	2020	4.1744	8.1631	5.3314	14.9982	0.8551	19.6000
3	2011	4.0943	8.1668	5.3295	11.1449	0.5017	17.3530
	2012	4.1109	8.2300	5.3484	12.7982	0.7255	17.5570

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2013	4.1271	6.9187	5.3144	12.5000	0.7201	17.6830
	2014	4.1431	6.6859	5.4185	12.9661	0.6598	17.8520
	2015	4.1589	9.5061	4.9604	14.0891	0.0450	17.9540
	2016	3.6889	9.4865	5.0923	13.2541	0.4694	18.1900
	2017	3.7136	9.6246	5.1246	14.2506	0.4293	18.2950
	2018	3.7377	9.6046	5.1095	13.1748	0.4391	18.4530
	2019	3.7612	9.6441	5.1664	14.1294	0.5777	18.4030
	2020	3.7842	9.6295	5.1660	12.9685	0.4825	18.2660
4	2011	3.8501	9.7119	5.2067	15.6607	0.6449	19.1010
	2012	3.8712	9.4364	4.7367	16.2099	0.6294	19.1890
	2013	3.8918	9.3997	4.7595	15.9346	0.6305	19.2510
	2014	3.9120	9.4803	4.8370	16.0608	0.5865	19.3200
	2015	3.9318	9.4265	4.7652	16.0866	0.6183	19.3170
	2016	3.2189	9.4922	4.8552	13.9119	0.8657	16.5290
	2017	3.2189	9.4152	4.8204	13.1426	0.9225	16.4640
	2018	3.2958	9.4335	4.8620	13.8898	0.9652	16.4490
	2019	3.3322	9.5011	4.8781	14.0673	0.9740	16.4150
	2020	3.3673	9.4789	4.8728	14.0719	0.9815	16.3720
5	2011	3.3322	9.5260	4.9249	13.0293	0.7663	15.9980
	2012	3.3673	9.5134	4.9344	13.0224	0.9753	16.1460
	2013	3.4012	9.6173	5.0117	13.2537	0.8647	16.3200
	2014	3.4340	9.5513	4.7714	13.5020	0.8865	16.4900
	2015	3.4657	9.4233	4.7215	13.7576	0.9934	16.7010
	2016	3.8918	9.4242	4.6924	15.0340	0.8245	19.4690
	2017	3.9120	9.4029	4.6878	15.0109	0.7859	19.6520
	2018	3.9318	9.4200	4.6768	15.5781	1.0026	19.6790

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2019	3.9512	9.2085	4.6023	16.1124	1.0063	19.7740
	2020	3.9703	9.3398	4.5288	16.1330	0.8017	19.8410
6	2011	3.9318	9.3306	4.5472	14.3210	1.3340	16.2450
	2012	3.9512	9.3360	4.4554	14.3780	1.4480	16.1850
	2013	3.9703	9.3844	4.4886	14.6360	1.5140	16.6130
	2014	3.9890	9.2557	4.3352	14.4732	1.4772	16.6070
	2015	4.0073	9.3238	4.3232	14.2760	1.7430	16.8050
	2016	4.2341	6.6107	5.3497	14.2875	0.8552	19.1700
	2017	4.2485	6.6053	5.3382	15.2683	0.9149	19.4200
	2018	4.2627	6.7405	5.4460	15.6160	0.7824	19.6090
	2019	4.2767	6.7166	5.3648	16.3843	0.7363	19.7110
	2020	4.2905	6.7476	5.4387	16.3125	0.6826	19.7500
7	2011	3.4657	6.7488	5.4290	8.6540	0.7255	17.5570
	2012	3.4965	6.7901	5.4759	8.4730	0.7201	17.6830
	2013	3.5264	6.7901	5.5140	8.7650	0.6598	17.8520
	2014	3.5553	6.7957	5.5114	8.9370	0.2460	14.7750
	2015	3.5835	6.8046	5.5444	8.9819	0.6666	15.4740
	2016	2.1972	8.2377	5.2293	14.5097	0.7090	17.6430
	2017	2.3026	8.2657	5.2889	14.4261	0.8591	17.7750
	2018	2.3979	8.1391	5.2466	15.1980	0.7590	17.6680
	2019	2.4849	8.1539	5.3033	15.6354	0.3747	17.7940
	2020	2.5649	8.1631	5.3314	14.6307	0.2910	17.8130
8	2011	3.4012	8.1668	5.3295	15.8102	0.8728	19.6580
	2012	3.4340	8.2300	5.3484	15.8072	0.8932	19.8750
	2013	3.4657	6.9187	5.3144	16.6319	0.7891	19.9760
	2014	3.4965	6.6859	5.4185	16.5526	0.7479	20.0780

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2015	3.5264	9.5061	4.9604	16.4875	0.7031	20.1670
	2016	3.4012	9.4542	4.9497	13.9028	1.1849	17.9400
	2017	3.4340	9.5228	4.9012	14.1470	0.6048	18.2130
	2018	3.4657	9.5394	4.9601	15.6077	1.2118	18.0570
	2019	3.4965	9.6181	5.0675	15.9390	0.9179	18.0520
	2020	3.5264	9.4597	5.0272	15.7806	0.9099	18.0200
9	2011	1.9459	9.4865	5.0923	14.2011	0.7321	16.5420
	2012	2.0794	9.6246	5.1246	14.7579	0.8858	16.4940
	2013	2.1972	9.6046	5.1095	15.0670	0.8644	16.5210
	2014	2.3026	9.6441	5.1664	15.1934	0.6584	16.6700
	2015	2.3979	9.6295	5.1660	15.2987	0.6175	16.6990
	2016	3.3322	9.7119	5.2067	14.7349	0.6570	17.6340
	2017	3.3673	9.4364	4.7367	14.4013	0.7435	17.5280
	2018	3.4012	9.3997	4.7595	14.5828	0.7150	17.2860
	2019	3.4340	9.4803	4.8370	14.6201	0.7444	17.2770
	2020	3.4657	9.4265	4.7652	14.8757	0.6861	17.4520
10	2011	3.0910	9.4922	4.8552	11.6827	0.7463	16.4950
	2012	3.1355	9.4152	4.8204	12.5462	0.7398	16.4970
	2013	3.1781	9.4335	4.8620	11.9296	0.7289	16.5040
	2014	3.2189	9.5011	4.8781	12.9837	0.7331	16.5760
	2015	3.2581	9.4789	4.8728	13.0078	0.6771	16.6000
	2016	2.1972	9.5260	4.9249	13.7061	0.8734	16.7990
	2017	2.3026	9.5134	4.9344	14.0772	0.8113	17.0230
	2018	2.3979	9.6173	5.0117	14.2170	0.7443	17.1170
	2019	2.4849	9.5513	4.7714	14.4033	0.7434	17.2600
	2020	2.5649	9.4233	4.7215	13.6780	0.8470	17.3220

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
11	2011	3.5835	9.4242	4.6924	12.4380	0.7331	16.5760
	2012	3.6109	9.4029	4.6878	12.6520	0.5751	16.1410
	2013	3.6376	9.4200	4.6768	13.4776	0.4641	16.3420
	2014	3.6636	9.2085	4.6023	12.3870	1.3509	18.0280
	2015	3.6889	9.3398	4.5288	13.4740	1.2511	17.9190
	2016	3.8918	9.3306	4.5472	14.8357	1.2531	17.9260
	2017	3.9120	9.3360	4.4554	14.6567	1.2726	18.0870
	2018	3.9318	9.3844	4.4886	15.1431	1.4072	18.0910
	2019	3.9512	9.2557	4.3352	15.4955	1.3509	18.0280
	2020	3.9703	9.3238	4.3232	16.1981	1.2511	17.9190
12	2011	3.6889	6.6107	5.3497	13.9230	0.9850	18.9890
	2012	3.7136	6.6053	5.3382	14.9697	0.9612	19.0720
	2013	3.7377	6.7405	5.4460	15.1743	0.9192	19.1650
	2014	3.7612	6.7166	5.3648	16.4039	0.9039	19.2970
	2015	3.7842	6.7476	5.4387	16.3720	0.7823	19.4800
	2016	2.7081	6.7488	5.4290	13.1488	0.7295	16.3890
	2017	2.7726	6.7901	5.4759	13.1722	0.9278	16.6360
	2018	2.8332	6.7901	5.5140	14.2912	1.1594	16.5740
	2019	2.8904	6.7957	5.5114	13.9164	1.5554	16.3710
	2020	2.9444	6.8046	5.5444	13.7920	1.5539	16.2580
13	2011	3.3322	6.7685	5.4654	15.9989	0.7521	20.0110
	2012	3.3673	6.8835	5.5875	16.5515	0.8152	20.1400
	2013	3.4012	8.2014	5.1845	17.1188	0.8607	20.2040
	2014	3.4340	8.1464	5.1521	17.2928	0.8461	20.2870
	2015	3.4657	8.2506	5.2611	17.1680	0.8482	20.3870
	2016	3.5264	8.2377	5.2293	13.1120	0.7856	15.3560

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2017	3.5553	8.2657	5.2889	13.4730	0.8798	15.2870
	2018	3.5835	8.1391	5.2466	13.2621	0.9050	15.4710
	2019	3.6109	8.1539	5.3033	13.1230	0.7086	15.4490
	2020	3.6376	8.1631	5.3314	13.7946	0.6175	15.4950
14	2011	2.4849	8.1668	5.3295	13.1780	0.4578	16.1280
	2012	2.5649	8.2300	5.3484	13.2730	0.9569	17.2340
	2013	2.6391	6.9187	5.3144	13.2089	0.9569	16.1100
	2014	2.7081	6.6859	5.4185	13.1657	0.9745	16.1740
	2015	2.7726	9.5061	4.9604	13.4661	1.0131	16.1680
	2016	3.8286	9.4542	4.9497	15.8709	0.6267	18.6280
	2017	3.8501	9.5228	4.9012	15.8396	0.6129	18.6470
	2018	3.8712	9.5394	4.9601	16.0799	0.5861	18.5350
	2019	3.8918	9.6181	5.0675	16.5700	0.5554	18.5150
	2020	3.9120	9.4597	5.0272	16.7438	0.4833	18.5590
15	2011	4.0073	9.4865	5.0923	14.1168	1.0014	18.7980
	2012	4.0254	9.6246	5.1246	16.1623	1.0204	18.9260
	2013	4.0431	9.6046	5.1095	16.3715	1.0236	18.9480
	2014	4.0604	9.6441	5.1664	16.3834	0.8621	19.1440
	2015	4.0775	9.6295	5.1660	16.4759	0.8087	19.1550
	2016	3.0445	9.7119	5.2067	12.5908	0.5526	16.1580
	2017	3.0910	9.4364	4.7367	12.6277	0.7279	16.1690
	2018	3.1355	9.3997	4.7595	13.0815	0.7565	16.0590
	2019	3.1781	9.4803	4.8370	13.3428	0.7639	16.0710
	2020	3.2189	9.4265	4.7652	13.5197	0.6948	16.1070
16	2011	3.0910	9.4922	4.8552	13.0425	0.7673	17.8210
	2012	3.1355	9.4152	4.8204	13.4555	0.8077	17.9900

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2013	3.1781	9.4335	4.8620	14.1686	0.7981	17.9950
	2014	3.2189	9.5011	4.8781	14.4548	0.6802	18.1720
	2015	3.2581	9.4789	4.8728	14.6174	0.5174	18.4220
	2016	3.4012	9.5260	4.9249	13.5625	0.8664	16.5760
	2017	3.4340	9.5134	4.9344	14.2903	0.9357	16.7660
	2018	3.4657	9.6173	5.0117	14.9790	0.9817	16.8540
	2019	3.4965	9.5513	4.7714	14.9697	0.8941	16.7760
	2020	3.5264	9.4233	4.7215	14.7987	0.7753	17.0470
17	2011	4.0254	9.4242	4.6924	14.3780	0.7652	19.4870
	2012	4.0431	9.4029	4.6878	14.7036	0.9881	19.1550
	2013	4.0604	9.4200	4.6768	14.9574	0.9687	19.1850
	2014	4.0775	9.2085	4.6023	14.8312	0.8440	19.3320
	2015	4.0943	9.3398	4.5288	14.5404	0.7652	19.4870
	2016	4.6347	6.6107	5.3497	16.0002	0.7967	19.2200
	2017	4.6444	6.6053	5.3382	16.2735	0.6692	19.2710
	2018	4.6540	6.7405	5.4460	16.1346	0.6576	19.3390
	2019	4.6634	6.7166	5.3648	16.2419	0.5920	19.4710
	2020	4.6728	6.7476	5.4387	16.4453	0.5290	19.4690
18	2011	3.4340	6.7488	5.4290	14.7419	0.7038	16.6240
	2012	3.4657	6.7901	5.4759	14.8352	0.8019	16.4880
	2013	3.4965	6.7901	5.5140	14.0358	0.8702	16.4400
	2014	3.5264	6.7957	5.5114	14.6208	0.7686	16.2270
	2015	3.5553	6.8046	5.5444	14.7272	0.6667	16.0370
	2016	3.4012	6.7685	5.4654	13.1792	0.7846	16.1420
	2017	3.4340	6.8835	5.5875	13.5055	0.8769	16.1620
	2018	3.4657	8.2014	5.1845	13.5092	0.7959	16.1550

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2019	3.4965	8.1464	5.1521	14.2825	0.8361	16.1420
	2020	3.5264	8.2506	5.2611	14.3957	0.8263	16.1410
19	2011	1.6094	8.2377	5.2293	10.7413	0.2053	15.3750
	2012	1.7918	8.2657	5.2889	10.8024	0.6607	15.8670
	2013	1.9459	8.1391	5.2466	10.9464	1.5704	15.5390
	2014	2.0794	8.1539	5.3033	11.8670	1.0925	15.6880
	2015	2.1972	8.1631	5.3314	12.9946	0.5709	16.5450
	2016	3.2958	8.1668	5.3295	9.6530	0.8361	16.1420
	2017	3.3322	8.2300	5.3484	11.2650	0.7652	19.4870
	2018	3.3673	6.9187	5.3144	10.3690	0.9743	16.9250
	2019	3.4012	6.6859	5.4185	9.6263	1.0103	17.0730
	2020	3.4340	9.5061	4.9604	13.4537	0.9504	17.2920
20	2011	3.4965	6.6107	5.3497	13.4492	0.8514	16.9100
	2012	3.5264	6.6053	5.3382	14.5950	0.9676	16.9340
	2013	3.5553	6.7405	5.4460	14.6453	0.8750	16.9450
	2014	3.5835	6.7166	5.3648	14.8834	0.7638	17.0580
	2015	3.6109	6.7476	5.4387	15.0790	0.7855	17.1450
	2016	2.3026	6.7488	5.4290	14.6052	0.8776	18.1600
	2017	2.3979	6.7901	5.4759	15.9889	0.7960	18.0540
	2018	2.4849	6.7901	5.5140	15.9219	0.9152	17.8410
	2019	2.5649	6.7957	5.5114	15.8584	0.8675	17.8080
	2020	2.6391	6.8046	5.5444	15.7852	0.7034	17.7090
21	2011	3.0910	6.7685	5.4654	13.7599	0.4417	17.9420
	2012	3.1355	6.8835	5.5875	14.5768	0.5362	18.0380
	2013	3.2581	8.2014	5.1845	14.9398	1.0000	18.2330
	2014	3.2189	8.1464	5.1521	14.7218	1.0000	18.3810

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2015	3.2581	8.2506	5.2611	15.1152	0.8940	18.6280
	2016	4.1109	8.2377	5.2293	15.3316	0.7624	19.2350
	2017	4.1271	8.2657	5.2889	13.5734	0.8834	19.3000
	2018	4.1431	8.1391	5.2466	14.2855	0.9457	19.3750
	2019	4.1589	8.1539	5.3033	14.4647	0.9055	19.4200
	2020	4.1744	8.1631	5.3314	14.9982	0.8551	19.6000
22	2011	4.0943	8.1668	5.3295	11.1449	0.5017	17.3530
	2012	4.1109	8.2300	5.3484	12.7982	0.7255	17.5570
	2013	4.1271	6.9187	5.3144	12.5000	0.7201	17.6830
	2014	4.1431	6.6859	5.4185	12.9661	0.6598	17.8520
	2015	4.1589	9.5061	4.9604	14.0891	0.0450	17.9540
	2016	3.6889	9.4865	5.0923	13.2541	0.4694	18.1900
	2017	3.7136	9.6246	5.1246	14.2506	0.4293	18.2950
	2018	3.7377	9.6046	5.1095	13.1748	0.4391	18.4530
	2019	3.7612	9.6441	5.1664	14.1294	0.5777	18.4030
	2020	3.7842	9.6295	5.1660	12.9685	0.4825	18.2660
23	2011	3.8501	9.7119	5.2067	15.6607	0.6449	19.1010
	2012	3.8712	9.4364	4.7367	16.2099	0.6294	19.1890
	2013	3.8918	9.3997	4.7595	15.9346	0.6305	19.2510
	2014	3.9120	9.4803	4.8370	16.0608	0.5865	19.3200
	2015	3.9318	9.4265	4.7652	16.0866	0.6183	19.3170
	2016	3.2189	9.4922	4.8552	13.9119	0.8657	16.5290
	2017	3.2189	9.4152	4.8204	13.1426	0.9225	16.4640
	2018	3.2958	9.4335	4.8620	13.8898	0.9652	16.4490
	2019	3.3322	9.5011	4.8781	14.0673	0.9740	16.4150
	2020	3.3673	9.4789	4.8728	14.0719	0.9815	16.3720

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
24	2011	3.3322	9.5260	4.9249	13.0293	0.7663	15.9980
	2012	3.3673	9.5134	4.9344	13.0224	0.9753	16.1460
	2013	3.4012	9.6173	5.0117	13.2537	0.8647	16.3200
	2014	3.4340	9.5513	4.7714	13.5020	0.8865	16.4900
	2015	3.4657	9.4233	4.7215	13.7576	0.9934	16.7010
	2016	3.8918	9.4242	4.6924	15.0340	0.8245	19.4690
	2017	3.9120	9.4029	4.6878	15.0109	0.7859	19.6520
	2018	3.9318	9.4200	4.6768	15.5781	1.0026	19.6790
	2019	3.9512	9.2085	4.6023	16.1124	1.0063	19.7740
	2020	3.9703	9.3398	4.5288	16.1330	0.8017	19.8410
25	2011	3.9318	9.3306	4.5472	14.3210	1.3340	16.2450
	2012	3.9512	9.3360	4.4554	14.3780	1.4480	16.1850
	2013	3.9703	9.3844	4.4886	14.6360	1.5140	16.6130
	2014	3.9890	9.2557	4.3352	14.4732	1.4772	16.6070
	2015	4.0073	9.3238	4.3232	14.2760	1.7430	16.8050
	2016	4.2341	6.6107	5.3497	14.2875	0.8552	19.1700
	2017	4.2485	6.6053	5.3382	15.2683	0.9149	19.4200
	2018	4.2627	6.7405	5.4460	15.6160	0.7824	19.6090
	2019	4.2767	6.7166	5.3648	16.3843	0.7363	19.7110
	2020	4.2905	6.7476	5.4387	16.3125	0.6826	19.7500
26	2011	3.4657	6.7488	5.4290	8.6540	0.7255	17.5570
	2012	3.4965	6.7901	5.4759	8.4730	0.7201	17.6830
	2013	3.5264	6.7901	5.5140	8.7650	0.6598	17.8520
	2014	3.5553	6.7957	5.5114	8.9370	0.2460	14.7750
	2015	3.5835	6.8046	5.5444	8.9819	0.6666	15.4740
	2016	2.1972	8.2377	5.2293	14.5097	0.7090	17.6430

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2017	2.3026	8.2657	5.2889	14.4261	0.8591	17.7750
	2018	2.3979	8.1391	5.2466	15.1980	0.7590	17.6680
	2019	2.4849	8.1539	5.3033	15.6354	0.3747	17.7940
	2020	2.5649	8.1631	5.3314	14.6307	0.2910	17.8130
27	2011	3.4012	8.1668	5.3295	15.8102	0.8728	19.6580
	2012	3.4340	8.2300	5.3484	15.8072	0.8932	19.8750
	2013	3.4657	6.9187	5.3144	16.6319	0.7891	19.9760
	2014	3.4965	6.6859	5.4185	16.5526	0.7479	20.0780
	2015	3.5264	9.5061	4.9604	16.4875	0.7031	20.1670
	2016	3.4012	9.4542	4.9497	13.9028	1.1849	17.9400
	2017	3.4340	9.5228	4.9012	14.1470	0.6048	18.2130
	2018	3.4657	9.5394	4.9601	15.6077	1.2118	18.0570
	2019	3.4965	9.6181	5.0675	15.9390	0.9179	18.0520
	2020	3.5264	9.4597	5.0272	15.7806	0.9099	18.0200
28	2011	1.9459	9.4865	5.0923	14.2011	0.7321	16.5420
	2012	2.0794	9.6246	5.1246	14.7579	0.8858	16.4940
	2013	2.1972	9.6046	5.1095	15.0670	0.8644	16.5210
	2014	2.3026	9.6441	5.1664	15.1934	0.6584	16.6700
	2015	2.3979	9.6295	5.1660	15.2987	0.6175	16.6990
	2016	3.3322	9.7119	5.2067	14.7349	0.6570	17.6340
	2017	3.3673	9.4364	4.7367	14.4013	0.7435	17.5280
	2018	3.4012	9.3997	4.7595	14.5828	0.7150	17.2860
	2019	3.4340	9.4803	4.8370	14.6201	0.7444	17.2770
	2020	3.4657	9.4265	4.7652	14.8757	0.6861	17.4520
29	2011	3.0910	9.4922	4.8552	11.6827	0.7463	16.4950
	2012	3.1355	9.4152	4.8204	12.5462	0.7398	16.4970

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2013	3.1781	9.4335	4.8620	11.9296	0.7289	16.5040
	2014	3.2189	9.5011	4.8781	12.9837	0.7331	16.5760
	2015	3.2581	9.4789	4.8728	13.0078	0.6771	16.6000
	2016	2.1972	9.5260	4.9249	13.7061	0.8734	16.7990
	2017	2.3026	9.5134	4.9344	14.0772	0.8113	17.0230
	2018	2.3979	9.6173	5.0117	14.2170	0.7443	17.1170
	2019	2.4849	9.5513	4.7714	14.4033	0.7434	17.2600
	2020	2.5649	9.4233	4.7215	13.6780	0.8470	17.3220
30	2011	3.5835	9.4242	4.6924	12.4380	0.7331	16.5760
	2012	3.6109	9.4029	4.6878	12.6520	0.5751	16.1410
	2013	3.6376	9.4200	4.6768	13.4776	0.4641	16.3420
	2014	3.6636	9.2085	4.6023	12.3870	1.3509	18.0280
	2015	3.6889	9.3398	4.5288	13.4740	1.2511	17.9190
	2016	3.8918	9.3306	4.5472	14.8357	1.2531	17.9260
	2017	3.9120	9.3360	4.4554	14.6567	1.2726	18.0870
	2018	3.9318	9.3844	4.4886	15.1431	1.4072	18.0910
	2019	3.9512	9.2557	4.3352	15.4955	1.3509	18.0280
	2020	3.9703	9.3238	4.3232	16.1981	1.2511	17.9190
31	2011	3.6889	6.6107	5.3497	13.9230	0.9850	18.9890
	2012	3.7136	6.6053	5.3382	14.9697	0.9612	19.0720
	2013	3.7377	6.7405	5.4460	15.1743	0.9192	19.1650
	2014	3.7612	6.7166	5.3648	16.4039	0.9039	19.2970
	2015	3.7842	6.7476	5.4387	16.3720	0.7823	19.4800
	2016	2.7081	6.7488	5.4290	13.1488	0.7295	16.3890
	2017	2.7726	6.7901	5.4759	13.1722	0.9278	16.6360
	2018	2.8332	6.7901	5.5140	14.2912	1.1594	16.5740

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2019	2.8904	6.7957	5.5114	13.9164	1.5554	16.3710
	2020	2.9444	6.8046	5.5444	13.7920	1.5539	16.2580
32	2011	3.3322	6.7685	5.4654	15.9989	0.7521	20.0110
	2012	3.3673	6.8835	5.5875	16.5515	0.8152	20.1400
	2013	3.4012	8.2014	5.1845	17.1188	0.8607	20.2040
	2014	3.4340	8.1464	5.1521	17.2928	0.8461	20.2870
	2015	3.4657	8.2506	5.2611	17.1680	0.8482	20.3870
	2016	3.5264	8.2377	5.2293	13.1120	0.7856	15.3560
	2017	3.5553	8.2657	5.2889	13.4730	0.8798	15.2870
	2018	3.5835	8.1391	5.2466	13.2621	0.9050	15.4710
	2019	3.6109	8.1539	5.3033	13.1230	0.7086	15.4490
	2020	3.6376	8.1631	5.3314	13.7946	0.6175	15.4950
33	2011	2.4849	8.1668	5.3295	13.1780	0.4578	16.1280
	2012	2.5649	8.2300	5.3484	13.2730	0.9569	17.2340
	2013	2.6391	6.9187	5.3144	13.2089	0.9569	16.1100
	2014	2.7081	6.6859	5.4185	13.1657	0.9745	16.1740
	2015	2.7726	9.5061	4.9604	13.4661	1.0131	16.1680
	2016	3.8286	9.4542	4.9497	15.8709	0.6267	18.6280
	2017	3.8501	9.5228	4.9012	15.8396	0.6129	18.6470
	2018	3.8712	9.5394	4.9601	16.0799	0.5861	18.5350
	2019	3.8918	9.6181	5.0675	16.5700	0.5554	18.5150
	2020	3.9120	9.4597	5.0272	16.7438	0.4833	18.5590
34	2011	4.0073	9.4865	5.0923	14.1168	1.0014	18.7980
	2012	4.0254	9.6246	5.1246	16.1623	1.0204	18.9260
	2013	4.0431	9.6046	5.1095	16.3715	1.0236	18.9480
	2014	4.0604	9.6441	5.1664	16.3834	0.8621	19.1440

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
	2015	4.0775	9.6295	5.1660	16.4759	0.8087	19.1550
	2016	3.0445	9.7119	5.2067	12.5908	0.5526	16.1580
	2017	3.0910	9.4364	4.7367	12.6277	0.7279	16.1690
	2018	3.1355	9.3997	4.7595	13.0815	0.7565	16.0590
	2019	3.1781	9.4803	4.8370	13.3428	0.7639	16.0710
	2020	3.2189	9.4265	4.7652	13.5197	0.6948	16.1070
35	2011	3.0910	9.4922	4.8552	13.0425	0.7673	17.8210
	2012	3.1355	9.4152	4.8204	13.4555	0.8077	17.9900
	2013	3.1781	9.4335	4.8620	14.1686	0.7981	17.9950
	2014	3.2189	9.5011	4.8781	14.4548	0.6802	18.1720
	2015	3.2581	9.4789	4.8728	14.6174	0.5174	18.4220
	2016	3.4012	9.5260	4.9249	13.5625	0.8664	16.5760
	2017	3.4340	9.5134	4.9344	14.2903	0.9357	16.7660
	2018	3.4657	9.6173	5.0117	14.9790	0.9817	16.8540
	2019	3.4965	9.5513	4.7714	14.9697	0.8941	16.7760
	2020	3.5264	9.4233	4.7215	14.7987	0.7753	17.0470
36	2011	4.0254	9.4242	4.6924	14.3780	0.7652	19.4870
	2012	4.0431	9.4029	4.6878	14.7036	0.9881	19.1550
	2013	4.0604	9.4200	4.6768	14.9574	0.9687	19.1850
	2014	4.0775	9.2085	4.6023	14.8312	0.8440	19.3320
	2015	4.0943	9.3398	4.5288	14.5404	0.7652	19.4870
	2016	4.6347	6.6107	5.3497	16.0002	0.7967	19.2200
	2017	4.6444	6.6053	5.3382	16.2735	0.6692	19.2710
	2018	4.6540	6.7405	5.4460	16.1346	0.6576	19.3390
	2019	4.6634	6.7166	5.3648	16.2419	0.5920	19.4710
	2020	4.6728	6.7476	5.4387	16.4453	0.5290	19.4690

Bank	Year	Financial inclusion	EFT POS	Mobile banking	Internet banking	Management quality	Bank size
37	2011	3.4340	6.7488	5.4290	14.7419	0.7038	16.6240
	2012	3.4657	6.7901	5.4759	14.8352	0.8019	16.4880
	2013	3.4965	6.7901	5.5140	14.0358	0.8702	16.4400
	2014	3.5264	6.7957	5.5114	14.6208	0.7686	16.2270
	2015	3.5553	6.8046	5.5444	14.7272	0.6667	16.0370
	2016	3.4012	6.7685	5.4654	13.1792	0.7846	16.1420
	2017	3.4340	6.8835	5.5875	13.5055	0.8769	16.1620
	2018	3.4657	8.2014	5.1845	13.5092	0.7959	16.1550
	2019	3.4965	8.1464	5.1521	14.2825	0.8361	16.1420
	2020	3.5264	8.2506	5.2611	14.3957	0.8263	16.1410
38	2011	1.6094	8.2377	5.2293	10.7413	0.2053	15.3750
	2012	1.7918	8.2657	5.2889	10.8024	0.6607	15.8670
	2013	1.9459	8.1391	5.2466	10.9464	1.5704	15.5390
	2014	2.0794	8.1539	5.3033	11.8670	1.0925	15.6880
	2015	2.1972	8.1631	5.3314	12.9946	0.5709	16.5450
	2016	3.2958	8.1668	5.3295	9.6530	0.8361	16.1420
	2017	3.3322	8.2300	5.3484	11.2650	0.7652	19.4870
	2018	3.3673	6.9187	5.3144	10.3690	0.9743	16.9250
	2019	3.4012	6.6859	5.4185	9.6263	1.0103	17.0730
	2020	3.4340	9.5061	4.9604	13.4537	0.9504	17.2920

Appendix III: Licensed Commercial Banks

ABC Bank (Kenya)
Bank of Africa
Bank of Baroda
Bank of India
Barclays Bank of Kenya
Chase Bank Kenya (In Receivership)
Citibank
Commercial Bank of Africa
Consolidated Bank of Kenya
Cooperative Bank of Kenya
Credit Bank
Development Bank of Kenya
Diamond Trust Bank
Dubai Islamic Bank
Ecobank Kenya
Equity Bank
Family Bank
First Community Bank
Guaranty Trust Bank Kenya
Guardian Bank
Gulf African Bank
Habib Bank AG Zurich
Housing Finance Company of Kenya
I&M Bank
Imperial Bank Kenya (In receivership)
Jamii Bora Bank
Kenya Commercial Bank
Mayfair Bank
Middle East Bank Kenya
National Bank of Kenya
NIC Bank
Oriental Commercial Bank
Paramount Universal Bank
Prime Bank (Kenya)
SBM Bank Kenya Limited
Sidian Bank[18]
Spire Bank[19]
Stanbic Bank Kenya
Standard Chartered Kenya
Bank AL Habib Limited
Trans National Bank Kenya
United Bank for Africa[20]
Victoria Commercial Bank