

**THE EFFECT OF DIGITAL INNOVATIONS ON THE FINANCIAL
PERFORMANCE OF THE BANKING INDUSTRY IN KENYA**

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DECLARATION

I, the undersigned, declare that this research project is my original work and has not been submitted to any other college, institution or university other than the University of Nairobi.

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LIST OF ABBREVIATIONS & ACRONYMS

| | |
|-------------|--|
| ATM | Automatic Teller Machine |
| CBK | Central Bank of Kenya |
| ICT | Information Communication Technology |
| IT | Information Technology |
| ROA | Return on Assets |
| ROE | Return on Equity |
| RTGS | Real Time Gross Settlement |
| SPSS | Statistical Package of Social Sciences |
| TAM | Technology Acceptance Model |
| TTF | Task Technology Fit |

ABSTRACT

Kenyan banks are hugely investing in technology-based innovations and training of workforce to use the new technologies. There is a need to study the relationship between the rising technology-based innovations of bank and the financial performance of the banks in Kenya to find out whether these innovations have contributed to the banks' financial performance in Kenya. This research project has studied the innovations linked to mobile banking, internet banking, credit and debit cards, electronic fund transfer, mobile banking and agency banking. The innovations are studied in relation to the effects on financial performance of banks by use of indicator, return on total assets.

The main objective of the study was to establish the effect of digital innovations on financial performance of banking industry in Kenya. Secondary data was used to carry out the research with focus on the banks listed. In the ending financial year 2017, there were 43 licensed banks in Kenya which are all targeted by the study and 1 mortgage financing institution.

The researcher did a Statistical analysis using SPSS 22 (Statistical Package of Social Sciences) software. From the analysis, the findings were that these technological innovations have varied effects on the return on total assets and profitability as a whole. Findings also indicated that mobile phones contribute higher than internet services in influencing the financial performance of the banks in Kenya. From this study and findings, it is evident that some of the digital innovations have a positive effect on the industry's performances and profitability thus the banks in Kenya should focus on even investing further in these technology-based innovations so that they can increase their income and impact on the economy. They should also engage the mobile phone providers as well as internet providers to penetrate further on innovations and reach even a larger customer base and grow their business. The project did not include all technology-based innovations because of time and a recommendation is made for other researchers to carry on further investigation that can be all inclusive.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

According to Lawrence (2010), innovation refers to the process whereby companies come up with new products or procedures of production to improve their operations and at times new products come as a result of the new processes used. In the financial service industry, innovation is regarded as the process of generating and promoting new technologies, markets, financial instruments and institutions that simplify trading, payments and access to information (Solans, 2003). Nofie (2011) states that innovation in the financial service industry, refer to coming up with a new or improved product or process which assists in lowering the production expenses of the existing financial services. Innovation is an essential factor in all sectors of the current economy because it makes companies to raise huge amounts of capital at lower costs as compared to manual work.

Reading about innovations one would find that financial innovation has been a fundamental element of economic activity for numerous millennia (Goetzmann, 2009). The process of innovation has been reinforced by the all-embracing and access to information and news financial developments, economic growths and market responses electronically. Yildirim and Philippatos (2007) in their research about the banking sectors of eleven Latin American nations, they determined that there always exists rivalry between banks which pressurizes them to implement new processes that can differentiate them in terms of services that they offer. As a result, they come up with financial service innovation. They further discuss that there is a high level of competitiveness in the financial industry leading to a high rate of foreign investment in banks. Consequently, banks will want to improve on the quality of

what cuts an edge for them and makes them different from the rest in providing their services. Therefore, they develop new skills, technologies and management which results to financial innovation (Yildirim and Philippatos, 2007).

There are a number of factors that influence innovation such as government laws, corporate governance, competition in the market, capital structure, institutional ownership, stock liquidity and attitude of the investors towards failure (Fang, Tian, and Tice, 2010).

1.1.1 Digital Innovation

The digital innovations have led to an improvement in the way banks conduct their businesses thus making them move from the norm of traditional operations to retail mode; more profitability, higher asset quality, lesser administrative costs and more efficient operations. For instance, according to Siam (2006), in Jordan, e-banking led to long-term strategies on saving costs and more satisfied clients. In 2010, Mabrouk and Mamoghli found that there was a positive relationship on the return on assets imitation of innovations of the banking industry in Tunisia. According to Aderonke and Charles (2010), the internet banking led to improved e-payment and e-commerce services in Nigeria and also resulted in reduction in the amount of cash in circulation.

According to Mwanja and Muganda (2011), efficient utilization of Information technology has resulted in the increase of access to financial services by the public, increased revenues and use of personnel and firms' assets. Ndung'u (2011), confirms this by noting that within a period of 4 years of introduction of mobile money transfer services in Kenya between 2007 and 2011, the mobile phone operators had about 15.4 million customers as well as 39,449 agents. According to (Omondi, 2017) years later after the introduction of mobile

phone banking, the number of transactions has increased massively with an average of Ksh13 billion mobile money transactions in a day and Sh400 billion a month recorded in 2017 leading to low costs of transactions and improved access to financial services.

Despite its positive effects, there are also challenges that have risen especially to the banks and regulators. For instance, in the recent past, there are people who engage in fraudulent activities which affect internet banking and mobile banking. There are criminals who manage to withdraw cash from people's accounts just by getting their cards that they use for online payments. Secondly, it poses complexities to regulators since with changes employed by the banks, the Central Bank of Kenya must also keep on toes since monetary procedures goes hand in hand with control, hence they must change their tools, operating procedures and targets now and then so as to coop with the trends of financial innovation and guarantee that the financial system is sustainable (Misati, Njoroge, Kamau, Ouma, 2010).

1.1.2 Financial Performance

Financial performance refers to the profitability of a business enterprise which can be measured by several measures for example, return on assets and return on equity. According to Misati, Njoroge, Kamau, Ouma (2010), it consists of four elements that is, customer-focused performance which includes satisfaction of the customers as well as service or product performance. Another one is financial and market performance which entails profits, revenue, market position and earnings per share. There is also human resource element which includes satisfaction of the employee and the last element is effectiveness of the organization which entails the level of innovation, time to market and flexibility of supply chain (Ahmed, Raza, Amjad and Akram, 2011). Financial performance

measures how well the organization is creating value for its shareholders (Ahmed, Raza, Amjad and Akram, 2011). Most financial firms including banks use a combination of financial ratios and other indicators to measure their financial performance.

A lot of the literature on financial performance of banks focus on maximizing returns and limiting risks (Boot & Thakor, 2007). There is a generally accepted relationship between return and risks thus, the higher the risk the higher the returns. There is a consistent rise in the competition in the banking sector, hence there is a need to develop new processes so as to remain competitive in the market and meet the customers demand.

Most organizations use financial indicators in measuring their performance. These include return on equity (ROE), profit before tax, return on assets (ROA), market share, productivity and many others. Profit after tax has also been widely used in measuring the performance of banks. There are different factors which affect the performance of the banks such as labor productivity, capital productivity, market size, shareholder's equity and liquidity.

1.1.3 Digital Innovation and Financial Performance

Profit-seeking companies continuously search for new and enhanced processes, products, and organizational structures that will assist in cutting costs of operations, yield higher profits and satisfy customer demands. Some firms conduct research and development programs while others use trial and error efforts to get what's working for them. If they are successful in these searches then they become innovations. According to Boot & Thakor (2007), innovations have positive effects on financial performance of the innovators.

According to Mathenge (2013), financial innovation is a constant process involving generation of new financial services, products, and processes of production as well as differentiation of homogenous products for the firms to compete in the endlessly changing economic environment. Thus, it is an essential part of financial performance because the innovation assists in reducing costs of production, increasing revenues and profits.

William (2003) states that both private and public sectors of several industrialized and industrializing nations conduct performance measurement and reporting. There is a common tool that is used for measuring performance of companies that is, key performance indicators (KPIs), since it offers intelligence on the basis of useful information about private and public agency's performance.

Hence, management of banks should identify and implement a tool for assessing the investment performance that suits them in terms of needs and circumstances. The evaluation ought to be done in intervals to certify that the banks achieve their investment objectives and find the general track of their past investment activity to assist in predicting the future. Profitability hints on the capability of the bank to take risks and increase its activity. The key pointers applicable in measurement of the profitability of bank include Return on Asset, ROA which is found by calculating $(\text{Net income} / \text{Total assets})$, financial leverage i.e. $(\text{Equity} / \text{Total Assets})$ as well as Return on equity, ROE which is got by finding $(\text{Net income} / \text{Average Equity})$ (Dardac and Barbu, 2005). These indicators of financial performance are watched for a given time to find the profitability tendencies. Ingraham (2005) notes the importance of performance measurement as it is essential for the public to observe and comprehend the results of organizational programs.

According to Ceylan, Emre and Asl (2008), people commonly use profit to measure performance of banks. Thus, the profitability of banks can be determined by ROA that is, the return on assets i.e. the ratio of the profits of the bank to total assets. Also, one can use Return on equity (ROE) to measure the performance of banks since it's the ratio of profits before tax to equity and banks with higher ratio of equity will obviously have a higher return on assets too.

1.1.4 Banking Industry in Kenya

In the Annual report of 2017, the Kenya Banking Sector had 1 mortgage finance company, 43 commercial banks, 3 credit reference bureaus, 13 microfinance banks, 7 representative offices of foreign banks, 18 Money Remittance Providers (MRPs), 8 non-operating bank holding companies, 74 foreign exchange bureaus (forex) and the Central Bank of Kenya (CBK) as the controlling authority (CBK, 2017). Among the 43 banking institutes, 3 are government owned while 40 are privately owned (CBK, 2017). 25 of the privately-owned banks are owned by the locals whereas 15 are owned by the foreigners. Among the 25 locally owned organizations, 1 is mortgage financier while 24 are commercial banks. There are 14 foreign-owned commercial banks where 3 are branches of foreign banks whereas 11 are local subsidiaries of foreign banks. All microfinance banks, forex bureaus, money remittance providers, licensed credit reference bureaus, representative offices and non-operating bank holding companies are privately owned (CBK, 2017).

The financial industry of Kenya has greatly improved in the past years with increase of financial products as well as improvement in the organizational structure and activities. This in effect has led to increase in efficiency of the financial system (CBK 2011; Misati, Njoroge, Kamau and Ouma 2010). Bank branch networks have also grown tremendously

from 1,102 commercial bank branches by end of June 2011 to 1,518 in 2017, which interpreted to a reduction of 23 branches. Customer deposits accounts have equally increased accounts from approximately 1million to 2.9 billion with over the same period (CBK, 2017). According to CBK, 2017 customer deposits are the major funding source for the banks and the growth in 2017 was mainly supported by the deposits' mobilization through mobile phone and agency banking platforms. Therefore, the Kenyan banking sector productivity score have improved whereby the ratio of staff to customers was 1:544 in 2017 in comparison to 1:474 in 2011.

Misati, Njoroge, Kamau and Ouma (2010) explains a review of the development of the financial industry in Kenya can be done in three stages. The first stage occurred in early 1970s to 1980s. During the first phase, the Kenyan financial industry was mainly conquered by the banking division, that had the characteristics of financial repression. Misati et al., 2010 states that the government played an essential part in allotting credit to investments by use of direct instruments of the monetary policy like controls of exchange rate, interest rate and allocating credit to priority sectors and administering other government restrictions Phase 2 of the banking sector started in late 1980s to early 1990s where there was the advent of liberalization of policies and Structural Adjustment Programs.

During the entire period, the exchange rate, interest rate and 9 capital account controls got relaxed. Phase 3 of the financial industry began in late 1990s to current and this study is based on this phase. During this period, there has been financial innovation and developing of financial instruments. This is the period that has brought with it development of new products like ATMs (Automated Teller Machines), Islamic banking, electronic-money,

mobile banking, agency banking, plastic money and many others in the banking industry (Misati et al., 2010). The Kenyan Banking sector is administered by the CBK Act, Banking Act and Companies Act.

1.2 Research Problem

There seems to be a great importance of financial innovation in banking industry, but there is insufficient understanding of the drivers of these innovations and effect on the performance of banks which needs to be studied. There have been related studies carried out but some have had mixed results in relation to the influence of financial innovations on the financial performance of the Kenyan banks. While some have stated that the innovations have least impact, others have stated that the innovations have a substantial impact on the profitability and performance. According to Pooja and Singh (2009), there is low effect of innovations on performance of banks whereas Mwanja and Muganda (2011) resolved that the innovation had substantial impact on the performance of bank.

There exists empirical evidence which shows innovation even though there are several unanswered questions in different areas like impact of technological innovations on banks (Lerner and Tufano, 2011). In 2011, Hendrickson and Nichols carried out a research on performance of small banks in the US linked to interstate branching. They determined that the banks improved their performance if they implement innovations in all their numerous branches. It is on the basis of these studies and literature gaps that necessitate a study on the related topic in Kenya where there is tremendous increase in bank technological innovations in the past decades.

Therefore, the researcher thought it wise to conduct this study based on the Kenyan banks so as to find out if there is effect of technological innovations on their financial performance. Kenyan banks especially the commercial banks continue to invest immensely on the technological innovations and trainings of workforce to operate them. Data from the Central Bank of Kenya 2017 shows agency banking grew from 92 million in 2010 to 139.7 million transactions in 2017. Additionally, the total assets increased from 1.7 billion in 2010 to 4 billion in 2017 in 2010 (CBK 2017).

Hence, there is need for a study to find the effect of digital innovations on the total income, return on total assets, customer deposits and profitability of Kenyan banks. This will assist in knowing whether the technological innovations have impacted the financial performance of the Kenyan banking sector.

1.3 Research Objective

The key objective of this research is to determine the effect of digital innovations on the financial performance of banking industry in Kenya.

1.4 Value of the Study

The information obtained from this research is advantageous to policy-makers both in the banks and government, especially in strengthening use of technological innovations considerations in this industry. Such developments can enhance the guidelines on how to better effectiveness and performance of the financial institutions. Information on the type of innovations that greatly impact the profitability of the banking sector can be used in ensuring the institutions make wise choices of technological investment and effectiveness in the management of the public funds. This might also improve the efficacy of financial

processes leading to more customer satisfaction. Hence, banks can achieve their goals and be able to compete effectively in the market.

The study is relevant to different stakeholders too such as financiers, investors and government in formulating and financial sector planning. Therefore, this study will assist the Kenyan government in its search for leveraging on technology to nurture its financial services industry and improve inclusion and access of finance. Innovations and information technology are some of the fundamental drivers of change in Kenya. Thus, the Kenyan government can use this study's findings to determine which innovation areas it can support in the banking sector either by offering tax waivers or additional non-monetary incentives.

Also, the results of this research can assist the Kenyan banks in assessing the significance of digital innovation on their financial performance with regards to reinforcing their profitability. The banks, particularly commercial types, are speedily becoming more mindful of the significance of digital innovation in this time of life so this research adds energy to data on the relationship between technological bank innovation and their financial performance. Additionally, the research findings will enlighten banking institutions on the type of innovations that have better influence on their financial performance, thus they can save costs of carrying out cost-benefit study in their organizations.

The findings of this research are also beneficial to the learners because it will add knowledge to the already existing information on technological innovations and how to improve on the existing ones.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives literature that is linked to the objectives of the research. It focuses on the review of the innovations of the banks and discusses the fundamental theories which underly the innovation. Then it gives the conceptual framework and illustrate the gaps in the relationship between technological innovations of banks in Kenya and their financial performance. There is a review of empirical studies undertaken and the variables under study in this research and giving conclusions on how the literature relates to these variables. The chapter also presents theories relevant to the research study and give a review of literature available from other scholars who researched on the related topics. The organization of the chapter is done in four parts.

2.2 Theoretical Review

A theory refers to an explanation of a relationship of a phenomenon. It gives a rational statement supported by evidence that is meant to clarify some phenomena. Theories offer comprehensive enlightenment to an incidence. Hence, a researcher ought to be well conversant with theories that apply to the study he/she is carrying out (Kombo and Tromp, 2009). The following theories are relevant in this study; innovation diffusion theory, agency theory, task technology fit theory, Schumpeter theory of innovation and technology acceptance model.

2.2.1 Innovation Diffusion Theory

Rogers (1962) argues that a product or an idea gains momentum over period, then diffuses (spreads) within a particular population or social system. This diffusion leads people to adopt new ideas, products or behaviors. By adoption, he means that they perform tasks in different ways than they previously did. For example, they can use new products or develop a new behavior. For adoption to happen the people must see the product, idea or behavior as new or innovative (Vaugh and Schavione, 2010). Adoption is a process thus some persons are more suitable to adopt than others in the social system. Therefore, individuals who adopt innovation first have a distinct characteristic than those who adopt the innovation later. It is essential to comprehend the traits of the target population when adopting the innovations

The factors which impact the diffusion of innovation are compatibility, trialability, relative advantage, complexity and observability (Rogers, 1983 & 2003). The diffusion of innovation theory discusses the kind of policymaking process in position for taking and applying innovations which are optional though authority, collective and liable innovation-decisions (Liu & Li, 2009). The theory however fails to inform of whether it holds in all types of companies or not (Lundblad and Jennifer, 2003). It also fails to address whether the theory and innovation characteristics interact to influence its adoption in firms, or if its adoption is affected by organizational size, type, or industry. The model, in the context of this study is useful in defining why some banking institutions would be fast to adapt new technologies.

Thus, any financial innovation that is compatible and shows relative advantage will be seen as a competitive advantage by banks in Kenya. If the banks implement and put them into practice, they can attract several customers/clients thus increasing client base which eventually translate into growth (Mwania & Muganda, 2011).

2.2.2 Schumpeter Theory of Innovation

This theory agrees with other investment theories of business cycle, which emphasizes that the change in investment with monetary expansion are usually the key factors determining the business fluctuations. The theory however, assumes that innovation in business is the core reason for increase in fluctuations in investments and business.

According to Schumpeter, innovation in the firms both in commercial and industrial is mainly the cause of the cyclical process. When talking about innovation Schumpeter means, production of new products, opening of new markets, the changes in the processes of production and transportation and change in the industrial organization. The innovation thus doesn't mean invention but defines the use of new methods, new technology, new material and new energy sources.

Schumpeter (1928) claimed that entrepreneurs, who are supposed to be R & D engineers or independent inventors in big organizations, came up with the opportunity for making new profits with their innovations. As a result, there were a group of imitators who got attracted by the huge profits they made thus they would start investing innovations that would wear down the profit margin brought by the innovation. Nevertheless, new innovations that were hypnotized by Schumpeter as Kondratiev cycles would arise to start new cycles even before the economy could equilibrate.

The bankers are capitalists since they are independent agents with no proprietary interest in the new firms, they fund so they bear all the risks without involving the entrepreneurs. Therefore, they need a superior capability to identify the possibility of success in sponsoring commercial activities. Therefore, Schumpeter highlighted that it is vital to supply credit to those who have the potential and equally deny those who lack it (Schumpeter, 1939). He gives a discussion on historical episodes of innovations within banking industry which suggest that financial innovation plays a positive role in financing the entrepreneurial undertakings that lead to growth. Porter (1992) supports Schumpeter's claims that innovation is essential for the long-term economic growth of a nation and its competitive advantage. The country ought to continuously invest and practice innovations and also upgrade its competitive advantage so as to compete effectively in the international markets (Porter, 1992). The Financial markets play key parts in mobilizing savings, facilitating transactions, managing risks, evaluating projects and monitoring managers.

2.2.3 Task Technology Fit Theory

The theory established by Goodhue and Thompson (1995) states that the probability of getting positive results on performance of individuals is based on Information Technology and that its usage can exceed the Information Technology capabilities in order to link up the tasks performed by users. These scholars came up with a task-technology fit measurement that comprised of 8 key aspects: authorization, quality, locatability, ease of use/training, compatibility, systems reliability, production timeliness, as well as users' relationship. The task-technology fit theory embraces that there is a possibility that Information Technology can have a positive influence on the performance of an individual thus it can be employed where the abilities of the IT match the tasks which the operator

needs to accomplish (Goodhue and Thompson, 1995). They determined that the TTF measure, along with application, is a substantial forecaster of reports of users enhanced job performance and success attributed to the employment of the system under study.

The theory stresses that there is a more likelihood to get a positive influence on performance of a person thus it can be employed if the ICT ability perfectly match the jobs that the user ought to complete (Goodhue and Thompson, 1995). The scholars state the aspects which measure task-technology fit to be; quality, ease of use, locatability, compatibility, authorization, reliability of the system, production timeliness, and relationship with users (Goodhue and Thompson, 1995).

All aspects are assessed on a range of 2 to 10 on the basis of a Likert scale of seven points ranging from strongly agree to strongly disagree. Goodhue and Thompson (1995) discovered tasks estimate, together with its use as a key determining factor of reports of consumers in the enhancement of performance of jobs and effectiveness attributable to use of the system. The analysis of the operation of this model is done individually even though there is a similar model offered by Zigurs and Buckland (1998) which works at the group level. The application of this theory is on the basis of information systems of varied range comprising of systems of e-business and expansion of several theories associated with output of information system like TAM.

The theory emphasizes that the accomplishment of an information system must be interrelated to the fit between technology and task, where success is linked to performance of an individual as well as performance of group (Zigurs and Buckland, 1998).

Goodhue and Thompson (1995) discuss that the model is suitable in the examination of numerous settings of a varied choice of information systems such as electronic commerce systems in combination of or use as an extension of other models linked to information systems results. Task-technology fit is generally relevant to mobile information systems. This theory states a match between IT and business tasks is vital to enlighten and forecast the information systems accomplishment (Goodhue and Thompson, 1995; Zigurs and Buckland, 1998). The concept promises to assist in identifying factors that are essential to offer support to a specified business task and can consequently, contribute towards the success of technological innovations (Mosoti & Masheka, 2010; Wyman, 2012; Muthui, 2013).

Barnes (2003) states that one of the like innovations is represented by mobile technology to back a progressively mobile workforce.

The model suggests that use of technology and its effect on Performance is dependent on how the technology and the task on hand fit together. This means that the success of a task is only possible if the user employs appropriate technology to perform that task (Olali, 2015). Therefore, in case of any mismatch then the technology will either fail to function or adversely affect the performance of the task. According to Goodhue and Thompson (1995) Task-technology fit theory embraces that IT is capable of positively affecting the performance of an individual and be useful if the abilities of the Information technology match the chores which the user ought to do. In the context of this study, this theory can assist in examining several tasks that are conducted by the technological systems in banks. If there is a good match, the banks can adopt other new innovations to improve their performance.

2.2.4 Technology Acceptance Model

According to Chyou, 2012; Ramdani and Kawalek (2008), this theory has been widely used by different scholars in the explanation of the Information technology applications in various fields. It is derived from theory of reasoned action and it highlights how users receive and embrace technology. According to Tolle (2016), the model gives a suggestion that major issues impacting customer decisions on when and how to use technology newly offered by a company are usually alleged in usefulness. The degree of belief of individuals on the use of given scheme influences performance of how they observe the ease of usage (Kiarie, 2013). Hence, a person might believe that use of a given application ought to be easy (Davis, 1989). Nevertheless, there has been an upgrading of this theory to include other aspects so as to explain and foresee the acceptance of new technology besides using only perceived ease of use and usefulness. For instance, the Technology Acceptance theory has been upgraded through incorporation of Roger's (1995) Diffusion of Innovation (DI) and Ajzen's (1991) Theory of Planned Behavior (TPB) to contain the alleged subjective norms and behavioral control.

When adopting the TAM model, one needs the comprehension of the requirements of final-users with regards to user friendliness and usefulness (Chuttur, 2009).

In a study conducted to determine the aspects that control internet banking acceptance by users, the researchers introduced professed credibility as a new aspect that mirrors the concerns of security and privacy of user in internet banking acceptance (Wang, Wang, Lin and Tang, 2003). They used TAM as a theoretical framework and their findings strongly back the prolonged TAM in foreseeing the aim of users to implement internet banking. According to Wang et al (2003), it additionally establishes the substantial effect of

computer self-efficiency on behavioral intention by alleged user-friendliness, credibility and usefulness.

2.2.5 Agency Theory

According to Jensen and Meckling (1976) theory, agency relationship refers to a contract that exists between two people whereby the principal involves another individual known as an agent to accomplish specified services on his/her behalf. Therefore, the agent is contracted by the principal to perform transactions for him/her with the third party (Seda, 2015). As a result, the principal can give the agent some decision-making authority. The agency banking model was first introduced in Kenya in 2010 by the CBK (Aduda, Kiragu, & Ndwiga, 2013). The model allows the third parties to offer varied banking services to customers on behalf of the commercial banks (CBK, 2011). Therefore, customers can perform different transactions like deposit of cash, withdrawals, fees payments, rent payments, etc. without visiting the physical banks.

2.3 Determinants of Financial Performance of Banks

The determinants of financial performance are classified into internal and external factors. These are variables that determine the output. Internal factors include characteristics of the banks affecting their performance. The factors are generally affected by internal decisions of the management and the board of directors. The external factors are nationwide and sector wide that are way beyond the control of the companies though they affect the performance of the banks.

The performance of banking industry in Kenya has been improving over the years. However, not all banks make profits since there are banks that declare losses (Njeri, 2012). Studies have shown that specific and macroeconomic factors affect the performance of

banks. However, there are still gaps on digital innovation and its effect on the financial performance of the banks.

2.4 Empirical Studies

There are other scholars who have researched related topics to this study both in Kenya and internationally. For instance, Dauda and Akingbade (2011) assessed how financial innovation affect the performance of commercial banks in Nigeria and found a strong positive correlation between innovation and the banks' employees' performance which boosts the profits and customer satisfaction. Another study conducted on Information technology in banking operations in Nigeria found that technology is the key driving power in the banking sector (Agboola, 2006). He found increased adoption of smart cards, EFTs, ATMs, office banking and electronic banking during his study. He discusses that implementation of IT enhances the banks image and leads to a faster, inclusive and better and well-organized market. He therefore recommends that banks should adopt ICT to increase the customer convenience, speed of service and accuracy or else they will lose their customers to their competitors.

Malhotra & Singh (2013) conducted a study on effect of internet banking on performance of banks in India. They gathered and used data of 82 commercial banks in the period between 1998-2007 and their regression analysis found that banks offering internet banking were better having a higher efficiency in their operations with comparison to traditional banks.

Additionally, in 2016 a study was conducted by Shirley and Sushanta to find out the effect of IT on the banking industry in the United States (Shirley and Sushanta, 2006). They analyzed how IT related financial innovations such as security investments, internet

banking, information exchanges and electronic payments can impact the profits of bank. Their research used 68 US banks panel for over 20 years period in the evaluation of the effect of Information Technology related financial innovations on the banks' profitability. Their findings were that even though IT may lead to reduction in cost, the banks spend so much on IT developments which consequently lower their profits.

Another study was conducted in Nigeria by Nwokah, Ugoji and Ofoegbu in 2009 to determine the impact of product development via innovations and the performance of the organization within the brewing industry in Nigeria (Nwokah, Ugoji, and Ofoegbu, 2009). They used questionnaire to collect data from 32 officials in production, research and development and marketing departments within four breweries in the southern areas of Nigeria. Their research found that there was a positive and significant relationship between the variables; product quality product lines/ mix and the sales volume, profitability, and customer loyalty.

According to Beck, Chen & Song (2012) in their study, they found that high levels of financial innovation had a positive relationship with a nation's development opportunities and capital and that finance innovations are linked with high growth within industries. In 2015, Magali discussed that 70% of non-urban SACCOs in Kenya had functioned on losses caused by lack of reliable techniques and financial innovations that could hinder credit risk. In his study, Mugo (2012), showed that MFIs innovated new services such as SME loans, mobile banking, business accounts, partnerships, school fees loans and financial trainings. Hence, he concluded that financial innovations in MFIs contributed to growth of firms in terms of product numbers, profitability, share of markets and loan sales.

Omondi (2013) conducted a study which determined that there was a very strong positive correlation between technological innovation and the financial performance of MFIs in Kenya. Thus, he explained that the variability of the financial performance was attributed to a large extent of the technological innovation in MFIs. Another study was carried out on by Njeri in 2012 on the impact of financial innovation on deposit taking SACCOs in Nairobi's financial performance and it was determined that there was a rising use of money transfers in forms of Mpesa and Airtel money, thus she concluded that there is a high positive correlation between the financial innovations and financial performance of the SACCOS in Nairobi (Njeri, 2012).

A research done in 2012 by Nyathira found that the effect of financial innovation was not always obvious because there were negative relationships cases between innovation and financial performance (Nyathira, 2012).

Moreover, a study conducted by Mwando (2013) on involvement of agency banking on performance of commercial banks in Kenya determined that agency banking led to reduction of costs of transaction thus positively affecting the financial performance of the Kenyan commercial banks. Also, the agency banking enhanced accessibility of banking services by customers since they are spread in all regions of the banks network. Additionally, the model enabled banks to bring banking closer to the customers, retain and expand their market share.

2.5 Conceptual Framework

The researcher has developed a conceptual framework and based the study on it to assist find the answers in the study. The dependent variable for the research is financial performance while the independent variable is technological innovations.

This conceptual framework depicts the relationship of technological innovations on financial performance of Kenyan banking sector and has been portrayed in the figure below.

Figure 2.5 shows that technological innovations (agency banking, mobile banking, debit and Credit cards, electronic funds transfer and internet banking) affect the banks financial performance as established by return on assets.

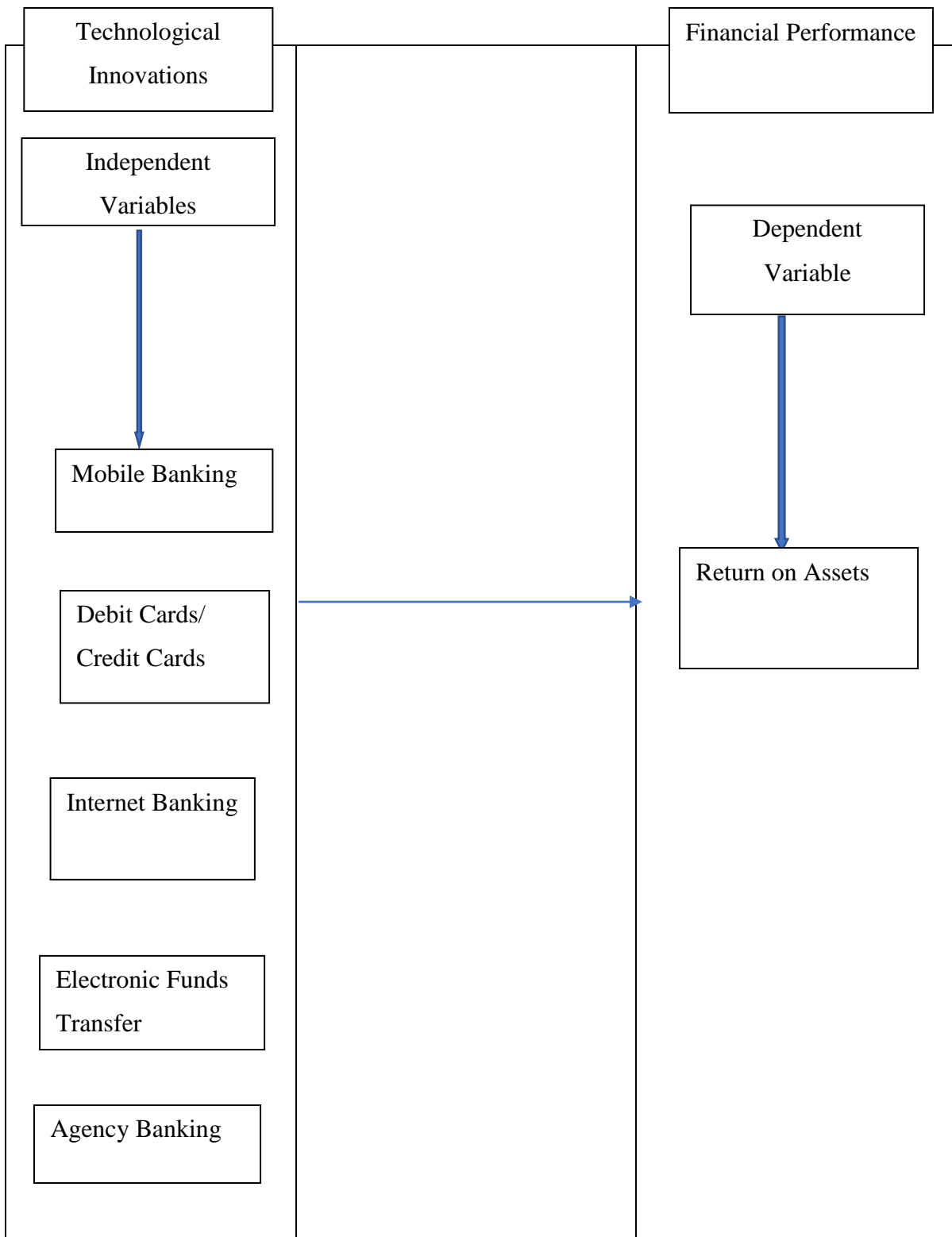


Figure 2.1: Conceptual Framework

Source: Researcher 2018

2.6 Summary of Literature Review

The chapter has reviewed research study findings from both the theoretical studies and empirical studies about the effect of technological innovation on performance of banking sector in Kenya. These emphasizes on the advantages that the banks derive from technological innovations including agency banking, electronic funds transfers, debit and credit cards, mobile banking and internet banking. There are several studies that have been conducted asserting that indeed technological innovations influence the financial performance of banks. The review has been done on empirical literature ranging from local to international studies.

The study is attached to innovation diffusion theory, agency theory, Technology Acceptance Model (TAM), task-technology fit theory, and Schumpeter Theory of Innovation. Some of the literature review from different scholars indicate that innovations positively impact the performance of banks. They are in agreement that the innovations lead to operational efficiency and better performance. However, there have been other scholars who found that innovations do not always lead to good performance of banks. This leads to mixed outcome mainly because there is no comprehensive analysis of innovations and various performance indicators. Also, most studies have left out agency banking. This research therefore has done a comprehensive study by combining other bank performance indicators left by other scholars.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodological processes that the researcher used in the research to determine the objectives of the study. It covers the area of study, population of interest, instrumentation and procedure of data collection and data analysis techniques. Research methodology refers to general principle or philosophy that gives guidelines of conducting a study (Dawson, 2009). The study will be conducted on the banking sector in Kenya.

3.2 Research Design

The researcher employed a descriptive study research design. The application of this technique assists in narrowing down an extensive study into a simple and researchable. The researcher chose descriptive research design since there is no possibility of manipulating the variables of the study. The study was investigating the technological innovations and their consequences on financial performance of banks in Kenya. According to Kothari (2004), this research design is significant in evaluation of the applicability of technical models and theories in the real world. Thus, it was used in the research to assist in finding the connection between technological innovations and financial performance of banks. The researcher has used secondary data in getting information to use for the research.

3.3 Population

In this study, the target population was 43 licensed banks in Kenya and one mortgage finance institution as at December 2017. The population was the banking sector in Kenya

and the information is got majorly from the CBK website as well as websites of the target banks.

3.4 Data Collection

The study employed the use of secondary data as extracted from the financial reports as published by banks, banking survey manuals, Kenya National Bureau of Statistics, books, Central Bank of Kenya, research papers and journal articles relating to effects of innovations on banking sector in Kenya. The secondary data was collected using data collection form designed to record data concerning transactions done using mobile banking, internet banking, Electronic Fund Transfer, Deposit cards and agency banking. The library and the internet were also be of great help in getting the information about the related literature and an overview of innovation and banking performance.

3.5 Data Analysis

The analysis of data included a discussion of the finding and interpretations in a systematic way. This study tried to analyze financial performance as well as some financial ratios of the banking sector. Thus, gave information on the return on assets and return on equity.

In addition, the researcher used electronic and manual methods of tabulation of the data gathered. The electronic method comprised of calculators and programs such as excel to analyze data. The researcher also used the SPSS program to analyze variable that needed ratings to make a comparison of the means which gave the output.

The study used descriptive analysis as well as multiple linear regression analysis in testing the statistical significance of the several independent variables (mobile banking, debit and credit cards, internet banking, electronic funds transfer and agency banking) on the

dependent variable (return on assets). The specific descriptive statistics included means, frequencies and standard deviations.

Financial performance of banks can be determined by different measures such as profit before tax, total income, customer deposits and return on assets, but the study used return on assets, thus the regression analysis was as follows:

$$\text{ROA (Return on Assets)} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Whereby

ROA = the Return on Assets of banks showing the financial performance of banks

X_1 = Transactions by Debit Cards and Credit Cards

X_2 = Transactions by Mobile banking

X_3 = Transactions by Internet banking

X_4 = Transactions by Electronic Funds Transfer

X_5 = Transactions by Agency Banking

X_1, X_2, X_3, X_4, X_5 represents the independent variables shown by the transactions performed by debit and credit cards, mobile banking, internet banking, electronic funds transfer and agency banking respectively. β_0 represent the constant determined by this model whereas $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$, are the coefficients for the individual independent variables which show the effect of independent variables on the dependent variable.

ϵ is the error term that denotes other factors influencing financial performance which are not captured by this model.

The research also used t-test of significance to test if the change in the independent variables are statistically significant. The t-statistics were calculated at 95% confidence level to test if there is any significant relationship between internet banking, agency banking, mobile banking, electronic fund transfer and debit and credit cards on the financial performance of banks in Kenya. The analysis was done using SPSS V.22 and the results were presented in a research report format.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATIONS

4.1 Introduction

This chapter comprises of the collected data presentation, its analysis and interpretation to the effect of digital innovations on the financial performance of the banking industry in Kenya. The researcher made a compilation of data and then employed SPSS and excel in the analysis. The researcher performed a regression analysis, correlation, and also used charts, figures and tables to present the data.

4.2 Descriptive Statistics Analysis

The descriptive statistics is presented in table 4.1 shown below:

Table 4. 1: Descriptive Statistics Analysis

| | Minimum | Maximum | Mean | Std. Deviation |
|---------------------------|------------|------------|--------------|----------------|
| ROA | 2.60 | 4.60 | 3.5500 | .80932 |
| Mobile banking | 575.00 | 1543.50 | 1034.6667 | 366.21467 |
| Agency banking | 30.01 | 139.75 | 75.6050 | 41.13857 |
| Electronic Funds transfer | 1568125.00 | 4375207.00 | 2921121.8333 | 1107670.62610 |
| Debit /Credit Cards | 215.60 | 338.10 | 248.2500 | 47.63657 |
| Internet Banking | 17.82 | 71.12 | 44.2259 | 20.21542 |

Source: Research Data

From table 4.1 above, the descriptive statistics presents the mean, minimum and maximum value as well as the standard deviation of the variables of the study. The return on assets (ROA) indicated an average of 3.55% within the period of the study. ROA had a standard deviation of 0.81% which depicted a low variation in return of assets in the banking sector in Kenya at the time of the study. The minimum value of ROA which was noted was 2.60% whereas maximum was 4.60%.

Also, the mean of agency banking transactions was 75.61 million with a standard deviation of 41.14 showing a low variation in the agency banking in the industry during the research period. The minimum agency transactions were 30.01 million whereas the maximum was 139.75 million.

Besides, the transactions performed by electronic funds transfer systems averaged 2,921,121.83 with a standard deviation of 1107670.63 which show a low variation during the period. The results also depicted that the minimum transactions by the Electronic funds transfer was 1,568,125 whereas the maximum was 4,375,207.

Additionally, the study showed that the average of debit/credit card transactions were 248.25 million with a standard deviation of 47.64 which indicates a low variation in the use of credit cards during that study period. The minimum debit/credit cards transactions were 215.60 million and the highest was 338.10 million.

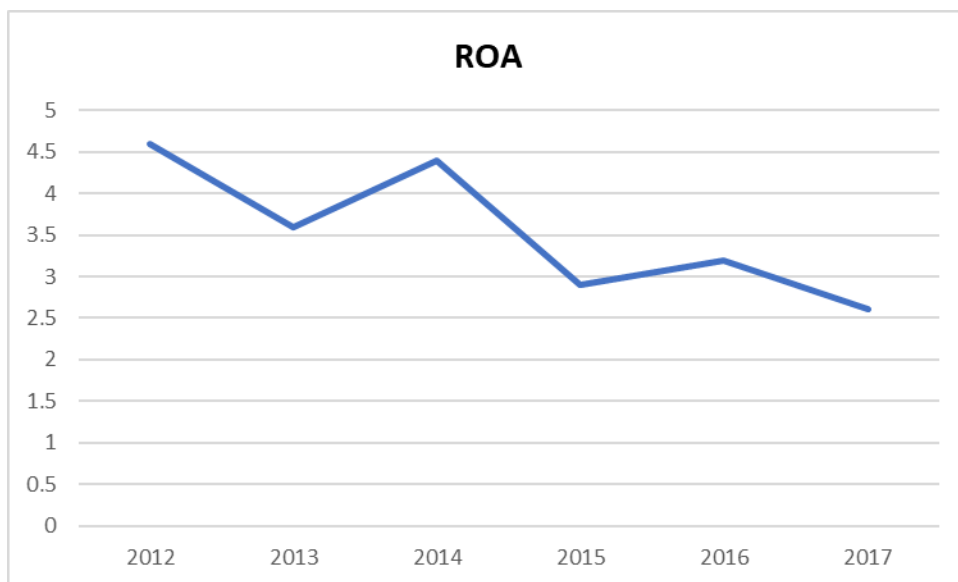
The mean number of Mobile Banking Transactions in the banking sector during the period of study was 1034.67 million. The standard deviation of the same was 366.21 million that showed a large variation in the number of mobile banking within the industry. The minimum transactions were 575.00 whereas the maximum was 1543.50 million.

The banking sector also had an average of 44.23 million transactions done by internet banking during the study period with a standard deviation of 20.22 million indicating a low variation in the internet banking during that period. The minimum internet transactions done during the period of research was 17.82 million while the maximum was 71.12 million.

4.3 Trend Analysis

This section gave an analysis of the demographic characteristics and statistics summary for the banking industry in Kenya during the study period.

Figure 4.1: Kenyan Banking Industry ROA FOR Year 2012 to 2017

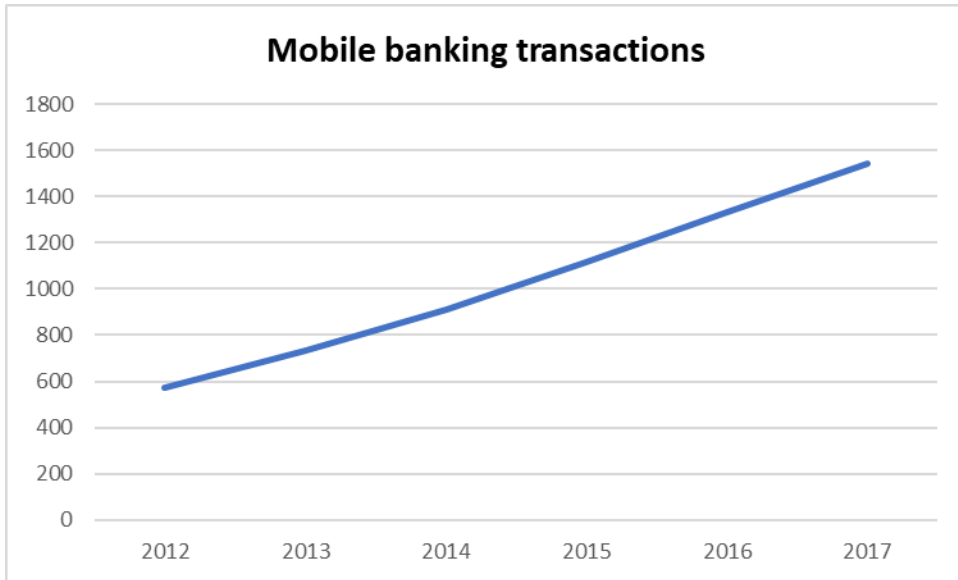


Source: Research data

From the figure 4.1 above, the ROA for the Kenyan Banking Industry was 4.60% in 2012. In 2013, ROA decreased to 3.6% then it rose in 2014 to 4.40% before declining again to 2.90% in the year 2015. In the year 2016, ROA increased to 3.20% then it dropped in value again to 2.60% in the ending year 2017. Therefore, ROA of the Kenyan banking industry is not stable as it keeps fluctuating from year to year.

Figure 4.2: Mobile Banking from Year 2012 to 2017

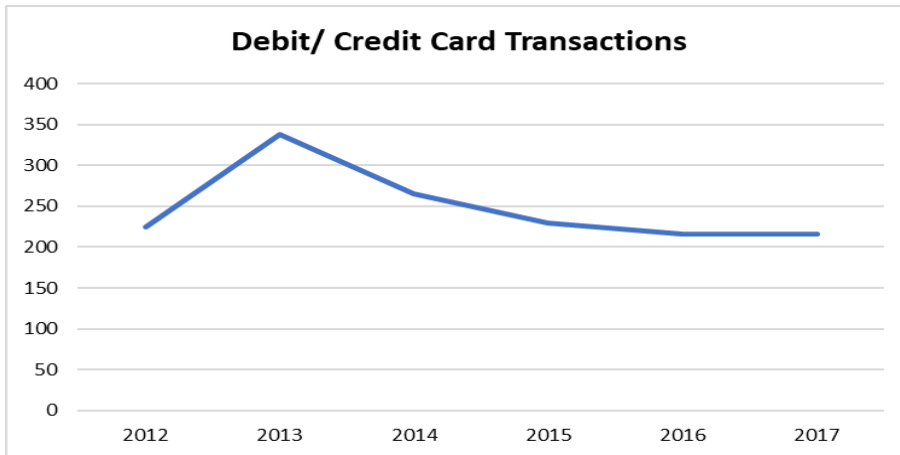
The following is figure showing the trend in mobile banking transactions from 2012 to 2017:



Source: Research Data

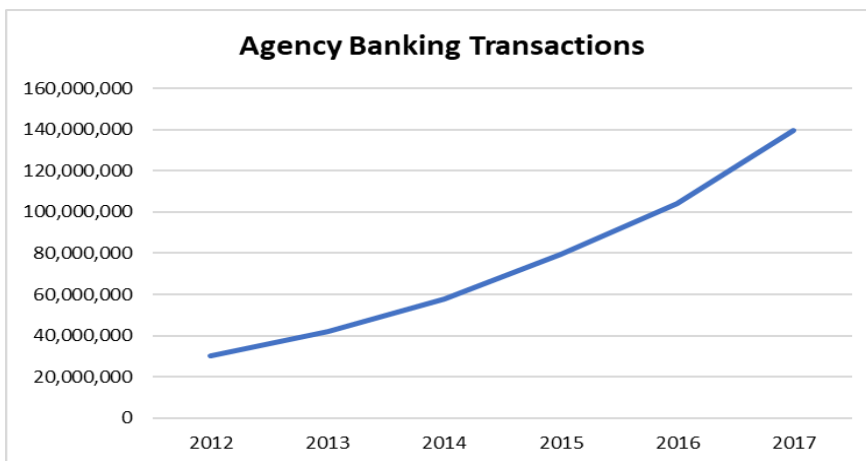
The results in figure 4.2 above depicts that transactions of mobile banking within the banking industry in Kenya has been on the rise gradually from 575 million in the year 2012 to 1543 million in 2017.

Figure 4.3 Debit/ Credit Card Transactions from year 2012 to 2017



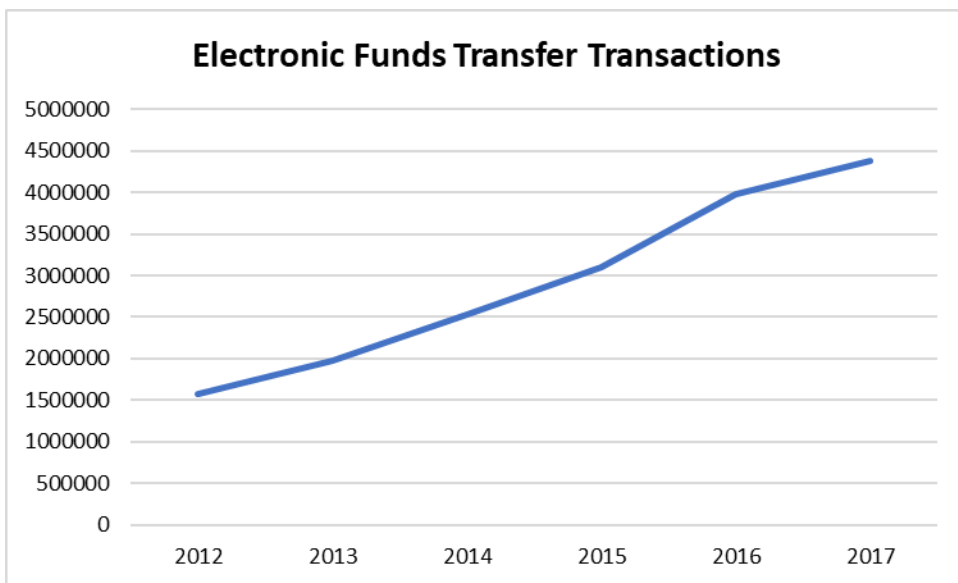
The results in figure 4.3 above indicates that transactions performed by debit/credit cards within the banking industry in Kenya keep fluctuating. For instance, in the year 2012 the industry recorded 224.6 million transactions which rose to 338.1million in 2013 before declining to 265.1 million in 2014. In 2015, it declined further to 216.2million then to 216.2million in 2016 and finally to 215.6million in 2017.

Figure 4.4 Agency Banking Transactions from 2012 to 2017



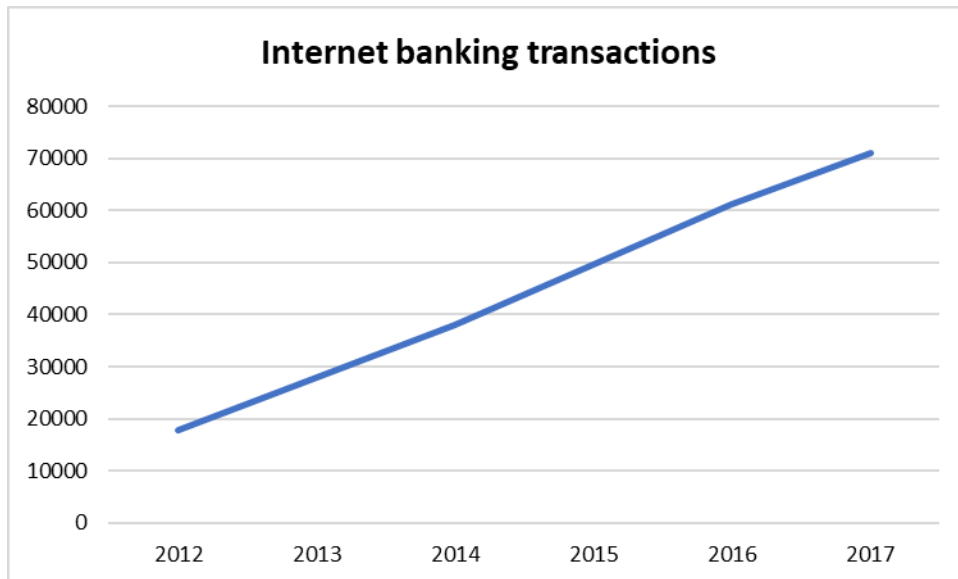
The results in the figure 4.4 above shows that the number of transactions done by agents in the banking industry in Kenya has been increasing steadily since 2012 to 2017. In the year 2012, the industry recorded 30,007,652 transaction; 42,055,854 transactions in 2013, 57,995,472 in 2014, 79,620,211 transactions in 2015, 104,193,459 transactions in 2016 and 139,751,189 transactions in 2017.

Figure 4.5 Electronic Funds Transfer Transactions from 2012 to 2017



From the figure 4.5 above, there has been a general increasing trend in the transactions done by electronic fund transfers. In 2012, the transactions were 1,568,125, which increased to 1,977,885 in 2013. The transactions then rose to 2,525,337 in 2014, 3,105,850 in 2015, 3,974,327 in 2016 and finally 4,375,207 in the year 2017.

Figure 4.6 Internet Banking Transactions from 2012 to 2017



The figure 4.6 above gives a general picture of the trend of the internet banking in the Kenyan banking sector. In 2012 the industry recorded 17,815.31million transactions done by internet banking which increased to 27,821.75million in 2013. In 2014, the transactions increased further to 37,909.84 million which then rose to 49,586.57 million in 2015. The transactions also increased in 2016 to 61,103.56million and finally to 71,118.58 in 2017.

The trend analysis of different variables above show that there has been a general upward trend in banking transactions performed by different digital innovation models even though the change in ROA has fluctuated over the same years.

4.4 Diagnostic Statistics

Table 4.2: Diagnostic Tests

| Indicators | Collinearity | | Normality Test | |
|---------------------------|--------------|-------|----------------|------------------------|
| | Tolerance | VIF | KURT | Std. Error of Kurtosis |
| Internet Banking | 0.156 | 8.254 | -1.365 | 1.741 |
| Debit/Credit Cards | .554 | 1.442 | 2.976 | 1.741 |
| Agency Banking | .128 | 5.016 | -0.560 | 1.741 |
| Electronic Funds Transfer | .0.203 | 4.915 | -1.661 | 1.741 |
| Mobile Banking | 0.194 | 9.283 | -1.271 | 1.741 |

Table 4.2 shows the diagnostic tests results about the collinearity and it depicts that the independent variables had a Tolerance Value of less than 1, for Internet banking was 0.156, Debit/ Credit Cards Tolerance was 0.554, Agency banking tolerance was 0.128, Electronic Funds transfer had tolerance of 0.203 and mobile banking tolerance was 0.194. The VIF for independent variables were 8.254 for Internet banking, 1.8442 for Debit/ Credit Cards, 5.016 for Agency banking, 4.915 for Electronic funds transfer and 9.283 for mobile banking. There was no multicollinearity that existed among the variables since the Tolerance was $>.1$ and $VIF < 10$ or an average that is much greater than 1.

The researcher performed a Kurtosis test to test the normality of data distribution. The results show that Internet banking had Kurt of -1.365 denoting a relatively flatter distribution; debit/credit cards had Kurt of 2.976 depicting a relatively peaked data distribution; Agency banking had Kurt of -0.560 indicating that there was relatively flatter

distribution; Electronic Funds transfer had Kurt of -1.661 and mobile banking had Kurt of -1.271 demonstrating a relatively flatter distribution. Therefore, the data displayed a platykurtic distribution so the data is not normally distributed in the banking sector.

4.5 Correlation Analysis

The researcher performed the correlation analysis to disclose the association of the independent variables and dependent variable. The presentation of the correlation analysis outcomes is in Table 4.3 below.

Table 4.3: Correlation Outcomes

| | ROA | Electronic Fund Transfer | Internet Banking | Debit/Credit Cards | Mobile Banking | Agency Banking |
|--------------------------|-------|--------------------------|------------------|--------------------|----------------|----------------|
| Pearson Correlation ROA | 1.000 | -.820 | -.842 | .250 | -.838 | -.829 |
| Electronic Fund Transfer | -.820 | 1.000 | .498 | -.546 | .547 | .455 |
| Internet Banking | -.842 | .497 | 1.000 | -.514 | .399 | .485 |
| Debit/Credit Cards | .250 | -.546 | -.514 | 1.000 | -.526 | -.543 |
| Mobile Banking | -.838 | .397 | .399 | -.526 | 1.000 | .491 |
| Agency Banking | -.829 | .475 | .385 | -.543 | .591 | 1.000 |
| Sig. 0.05 (2-tailed) | . | .046 | .036 | .633 | .037 | .041 |

From table 4.3 above, the correlation of Return on Assets (ROA) of the banking sector to Electronic Fund Transfer is -0.820 which means that there is a strong negative correlation of the variables.

The correlation of ROA to Internet banking is -0.842. Hence, internet banking is negatively correlated to the return of assets of the banking sector in Kenya. Thus, the internet banking does not contribute to positive change in return of assets of the banking industry. As a result, an increase in internet banking is associated with a decrease in return on assets.

The correlation of ROA to debit/credit cards usage is 0.250. This means that there is a positive correlation between the use of debit/credit cards and the return of assets of the banking industry in Kenya. Consequently, an increase in debit/credit card use is linked to increase in the return on assets.

The correlation of ROA to mobile banking is -0.838. Therefore, mobile banking has a negative relationship with the return of assets of the banking sector in Kenya. Thus, the mobile banking does not contribute to positive change in return of assets of the banking industry.

The correlation of ROA to agency banking is -0.829. This shows that there is a strong negative relationship between the agency banking and the return of assets of the banking sector in Kenya. Thus, the agency banking does not influence a positive change in return of assets of the banking industry.

4.6 Regression Analysis and Hypotheses Testing

This section entails the results of the multiple regressions performed for the data collected for the period between 2012 and 2017. The regression analysis was done to determine the relationship between the predictor variables agency banking, internet banking, debit/credit cards, electronic funds transfer and the dependent variable.

Table 4.4 shows that the R-Squared, also known as the coefficient of determination, was 0.782 that signifies that 78.20% of the changes in return on assets (ROA) are explained by the independent variables: agency banking, debit/credit cards, electronic funds transfer and internet banking while 21.80% of the variations in ROA are explained by the other factors that the model didn't include.

Table 4.4: Regression Analysis Results

| Regression Model Summary: Dependent variable ROA | | | | | |
|---|-----------------------------|------------|---------------------------|--------|------|
| R | | | 0.884 | | |
| R Square | | | 0.782 | | |
| Adjusted R Square | | | -0.089 | | |
| Std Error | | | 0.84471 | | |
| Regression Coefficients | | | | | |
| Model | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
| | B | Std. Error | Beta | | |
| (Constant) | 4.971 | 4.923 | | 1.010 | .497 |
| Internet Banking | -0.106 | .260 | -2.651 | -0.407 | .754 |
| Debit/Credit cards | -.003 | .011 | -.170 | -.271 | .831 |
| Agency Banking | -.010 | .055 | -.487 | -.174 | .891 |
| Electronic Funds Transfers | -0.016 | .000 | 2.208 | .339 | .792 |
| Mobile Baking | -0.559 | .000 | .567 | 0.567 | .867 |

Predictors denotes the agency banking transactions, mobile banking, debit/credit cards transactions, internet banking transactions and electronic funds transfer transactions. The dependent variable is the financial performance of the banking sector which is measured

by return on assets. The outcome of the regression analysis given on the model summary can be expressed as follows:

$R = 0.884$ refers to the square root of R-Squared and stands for the correlation between the predicted and observed values of the dependent variable.

R-Square = 0.782: denotes the percentage of variance in the dependent variable, in this case, financial performance as expressed by ROA that can be projected from the independent variables; agency banking transactions, debit/credit cards transactions, internet banking transactions and electronic funds transfer transactions. Therefore, this R-Square value designates that 78.20% of the variance in scores of sciences can be projected from the variables; agency banking transactions, debit/credit cards transactions, internet banking transactions and electronic funds transfer transactions. It is essential to note that R-Square is also known as the coefficient of determination. Hence, it is the overall measure of the strength of the association, and it doesn't mirror the extent to which any of specific independent variable is related with the dependent variable.

Adjusted R-square = -0.089 as addition of predictors to the model to the model takes place, every predictor would give an explanation of some of the variance in the dependent variable basically attributable to chance. An individual may proceed to add more predictors to the model that can proceed to improve the capability of the predictors to explain the dependent variable, even if some of this rise in R-square may just be by chance of variation in that exact sample. This R-square tries to offer a more candid value to guesstimate the population's R-squared. Introduction of more independent variables to the model can lead to a greater difference between R-square and adjusted R-square.

Therefore, if more independent variables can be introduced to this model then ROA can be estimated more correctly.

The Std. Error of the Estimate refers to the square root of the Mean Square of Residual and it denotes the standard deviation of the error term.

The results in the coefficients table shows that there is existence of a negative and significant relationship between electronic funds transfer and ROA. This finding was backed by a regression coefficient of -0.016 and a p value of 0.792. The stated p value was greater than the critical value of p which is 0.05. A regression coefficient of -0.016 suggests that a unit increase in electronic funds transfers leads to a 0.016 units reduction in Return on Assets. Furthermore, the findings show a negative and significant relationship between internet banking and Return on Assets (ROA). This result is given support by the regression coefficient of -0.106 and a p value of 0.754. The stated p value was greater than the critical p value of 0.05. Therefore, a regression coefficient of -0.106 suggests that a unit rise in internet banking contributes to a 0.106 units reduction in ROA. Additionally, the results also indicated a negative significant relationship between debit/credit cards and ROA. This was given the support by the beta coefficient of -0.003 and a p-value of 0.831 (p-value is greater than 0.05) which implies that a unit upsurge in debit/credit cards will lead to a 0.003 increase in Return on Assets. Moreover, the regression coefficient of agency banking is -0.010 showing that there is a negative relationship with ROA. And the association is significant as supported by the p-value of 0.891 which is greater than 0.05. Furthermore, the regression coefficient of mobile banking is -0.559 showing that there is a negative relationship with ROA. And the association is significant as supported by the p-value of 0.867 which is greater than 0.05.

4.4.3 Analysis of Variance

Table 4.5: ANOVA

| Model | Sum of Squares | Df | Mean Square | F | Sig. |
|------------|----------------|----|-------------|------|------|
| Regression | 2.561 | 4 | .640 | .897 | .649 |
| Residual | .714 | 1 | .714 | | |
| Total | 3.275 | 5 | | | |

The ANOVA table shows that the overall model reported a p-value of 0.649 which is higher than the critical p-value of 0.05. Therefore, the results suggest that the independent variables are good joint predictors of Return on Assets.

4.5 Interpretation of the Findings

The trend analysis performed depicted that there is a fluctuating change in ROA of the Kenyan banking industry every year from 4.60% in 2012, 3.60% in 2013, 4.40% in 2014, 2.90% in the year 2015, 3.20% in 2016 and then it dropped in value to 2.60% in the ending year 2017. There was a general increase in different digital innovations including mobile banking, agency banking, internet banking, electronic funds transfers, and debit/credit cards.

Then the findings display that there is a negative correlation between agency banking, mobile banking, electronic funds transfers and internet banking and ROA. Again, the outcome shows a positive correlation of debit/credit cards to ROA of the Banking industry in Kenya. The findings of the regression analysis show that there is a negative and

significant relationship between the independent variables; agency banking, internet banking, electronic funds transfer and mobile banking to ROA.

The findings of the study also confirm the conclusions of a study by Kabira (2013) which found agency banking transactions does not directly correlate with the financial performance of banks. The study finding of a negative relationship between product innovation and ROA confirms this study. The study's findings also confirm the outcomes of a study conducted by Arnaboldi and Claeys (2010) that made a conclusion that the performance of banking groups with an internet bank is poor.

The conclusion of the study was that the digital innovations in this study fail to form synergies with other banking happenings, thus, they do not improve financial performance of the banking industry on their own.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five entails the presentation of the summary of the findings of the research on the basis of the research objective which was to determine the effect of digital innovations on the banking industry in Kenya. Then it gives the conclusion and recommendations. The researcher then suggested areas of further research and also gave the limitations of the study. The significance of the research project was to determine the influence of digital innovations on the financial performance of Banking industry in Kenya.

5.2 Summary of Key Findings

The study pursued to examine the impact of digital innovations on financial performance of the banking industry in Kenya. The major problem was that there is an increasing number of digital innovations by the banks in Kenya, but the drive to undertake such innovations is not known. Therefore, the researcher wanted to find out if the innovations in the banking industry are the key determinants of its financial performance.

The trend analysis showed a fluctuating trend in mean of ROA of the banking industry in Kenya. From 4.60% in 2012 to 3.60% in 2013 then to 4.40% in 2014 before decreasing again to 2.90% in 2015. In the year 2016, ROA increased to 3.20% then it dropped in value again to 2.60% in 2017.

The transactions performed by mobile banking within the banking industry in Kenya has been increasing yearly from 575 million in 2012 to 1543 million in 2017. The transactions performed by debit/credit cards within the banking industry in Kenya keep fluctuating too.

For instance, in the year 2012 the industry recorded 224.6 million transactions which rose to 338.1million in 2013 before decreasing to 265.1 million in 2014. In 2015, it decreased further to 216.2million then to 216.2million in 2016 and finally to 215.6million in 2017.

The number of agency banking transactions has been increasing progressively since 2012 to 2017. In the year 2012, the industry recorded 30,007,652 transactions; 42,055,854 transactions in 2013, 57,995,472 in 2014, 79,620,211 transactions in 2015, 104,193,459 transactions in 2016 and 139,751,189 transactions in 2017.

Besides, the transactions done by electronic fund transfers has been increasing annually. In 2012, the transactions were 1,568,125, which increased to 1,977,885 in 2013. The transactions then rose to 2,525,337 in 2014, 3,105,850 in 2015, 3,974,327 in 2016 and finally 4,375,207 in the year 2017. Additionally, the internet banking transactions have been rising yearly. The Kenyan banking sector in 2012, recorded 17,815.31million transactions done by internet banking which increased to 2,7821.75million in 2013. In 2014, the transactions increased further to 37, 909.84 million which then rose to 49,586.57 million in 2015. The transactions also increased in 2016 to 61,103.56million and finally to 71,118.58 in 2017.

Moreover, the study revealed that the digital innovations do not necessarily contribute to positive change in the financial performance of the banking sector in Kenya. This was confirmed by different analysis done including multiple regression and correlation.

From the analysis, the study established that there is existence of a strong negative correlation between agency banking, mobile banking, electronic fund transfers and internet banking and the Return on Assets of the Banking industry in Kenya. Therefore,

these digital innovations on their own have a negative association to the financial performance of the banking sector. Additionally, the study showed that there is a significant positive correlation between the debit/credit cards transactions. Hence, this innovation on its own has a positive association with the financial performance of the Kenyan banking industry.

Furthermore, the study found that financial performance of the banking sector as expressed by ROA was significantly predicted by the independent variables that are agency banking, mobile banking, electronic fund transfers, debits and credit cards and internet banking.

On the other hand, the regression analysis findings displayed that there is a negative and significant relationship between agency banking, mobile banking, electronic funds transfer, internet banking and ROA. The relationship between debit/credit cards and ROA and was found to be positive and significant.

5.3 Conclusions

The study concluded that during the period of research, the banking industry in Kenya had changeable trends in ROA regardless of the fact that the banks continue to invest more on the digital innovations, thus more innovations were developing in the sector. Also, the study concluded that the relationship between agency banking, mobile banking, internet banking and electronic funds transfer and financial performance of the banking sector is negative and significant. In addition, the study concluded that the relationship between use of debit and credit cards and financial performance of the banking industry in Kenya is positive and significant.

Therefore, the banking industry should invest in these technological innovations since they contribute to customer satisfaction and from the analysis of the transactions, there's high volumes of transactions performed by them. However, the banking sector need to check other factors that affect financial performance and work on reducing the costs associated with each so as to stabilize its profitability. From this study, the innovations alone cannot improve the performance of banks.

5.4 Recommendations

The study recommends that the banking industry ought to implement more digital innovations and also look into other factors that affect Return on Assets so that they can address them as the innovations alone are not enough in determining the financial performance of the industry. This will curb the fluctuating changes in ROA and perhaps lead to an upward trend.

Furthermore, the study recommends that the banking industry should concentrate on implementing innovations that will not increase their risks of operation as this will affect their financial performance.

Moreover, the study also recommends that banking industry ought to put more focus and invest highly in electronic funds transfer which is currently getting replaced by RTGS as this makes payments and other transactions more convenient for the customers and will lead to a financial performance of the industry.

5.5 Limitations of Study

Due to resource and time constraints, the study only reviewed the innovations in the banking industry and left other players in the financial sector like insurance, microfinance

firms, the stock exchange, pension funds and SACCOs (Savings and Credit Cooperatives). Therefore, this offer an opportunity to conduct a further study.

5.6 Areas for Further Studies

The researcher suggests that further areas of study ought to emphasize on a longer duration than what the time period used in this study. This would explain if the relationship observed by the researcher can change if the study is conducted in a longer period, thus others scholars may base their studies on 10 years to observe the relationship changes over the years.

Also, further studies may be carried out to determine if the other factors that explain variations in ROA apart from the aspects employed in this study. Besides, the project did not include all technology-based innovations because of time and a recommendation is made for other researchers to carry on further investigation that can be all inclusive.

Another area for further research is to cover the whole financial industry since the researcher only concentrated on the banking industry leaving out other players in the financial sector such as insurance, microfinance firms, the stock exchange, pension funds and SACCOs (Savings and Credit Cooperatives).

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APPENDICES

Appendix I: List of Banks in Kenya

1. African Banking Corporation Limited
2. Bank of Africa Kenya Limited
3. Bank of Baroda (K) Limited
4. Bank of India
5. Barclays Bank of Kenya Limited
6. Charterhouse Bank Limited
7. Chase Bank (K) Limited In Receivership
8. Citibank N.A Kenya
9. Commercial Bank of Africa Limited
10. Consolidated Bank of Kenya Limited
11. Co-operative Bank of Kenya Limited
12. Credit Bank Limited
13. Development Bank of Kenya Limited
14. Diamond Trust Bank Kenya Limited
15. DIB Bank (Kenya) Limited
16. Ecobank Kenya Limited
17. Spire Bank Ltd
18. Equity Bank Kenya Limited
19. Family Bank Limited
20. Fidelity Commercial Bank Limited
21. First Community Bank Limited

22. Guaranty Trust Bank (K) Ltd
23. Guardian Bank Limited
24. Gulf African Bank Limited
25. Habib Bank A.G Zurich
26. Habib Bank Limited Postal
27. Imperial Bank Limited In Receivership
28. I & M Bank Limited
29. Jamii Bora Bank Limited
30. KCB Bank Kenya Limited
31. Middle East Bank (K) Limited
32. National Bank of Kenya Limited
33. NIC Bank Limited
34. M-Oriental Bank Limited
35. Paramount Bank Limited
36. Prime Bank Limited
37. Sidian Bank Limited
38. Stanbic Bank Kenya Limited
39. Standard Chartered Bank Kenya Limited
40. Trans-National Bank Limited
41. UBA Kenya Bank Limited
42. Victoria Commercial Bank Limited
43. Mayfair Bank Limited
44. Licensed Mortgage Finance Institution; HFC Limited

Appendix II: Data Collection Form

| Banking Industry | ROE | ROA | Income Before Tax | Total Assets | M-Banking Transactions | Debit/Credit Card Transactions | Agency Banking Transactions | Internet Banking Transactions | Electronic (Rtgs) Transactions |
|-------------------------|------------|------------|--------------------------|---------------------|-------------------------------|---------------------------------------|------------------------------------|--------------------------------------|---------------------------------------|
| Year | % | % | Million | Million | Million | Million | Million | Million | Million |
| 2017 | 20.60 | 2.60 | 133,196 | 4,002,741 | 1,543.50 | 215.6 | 139,751,189 | 71118.58 | 4375207.00 |
| 2016 | 24.40 | 3.20 | 147,445 | 3,695,943 | 1,331.00 | 216.2 | 104,193,459 | 61103.56 | 3974327.00 |
| 2015 | 23.80 | 2.90 | 134,017 | 3,492,643 | 1,114.20 | 229.9 | 79,620,211 | 49586.57 | 3,105,850 |
| 2014 | 28.10 | 4.40 | 141,145 | 3,199,396 | 911.30 | 265.1 | 57,995,472 | 37909.84 | 2,525,337 |
| 2013 | 28.90 | 3.60 | 125,760 | 2,703,394 | 733.00 | 338.1 | 42,055,854 | 27821.75 | 1,977,885 |
| 2012 | 29.80 | 4.60 | 107,898 | 2,330,335 | 575.00 | 224.6 | 30,007,652 | 17815.31 | 1,568,125 |

Appendix III: Measurement of Independent Variables

| Independent Variables | Measurement Method |
|---------------------------|--|
| Mobile Banking | Number of transactions performed by mobile banking |
| Credit Cards | Transaction performed by Credit Cards |
| Debit Cards | Transaction performed by Debit Cards |
| Agency Banking | Number of Transactions done by Banks' Agents |
| Electronic Funds Transfer | Transactions by Electronic Fund Transfer |
| Internet Banking | Transaction performed by Internet banking |