EFFECTS OF MOBILE BANKING ON PROFITABILITY OF COMMERCIAL BANKS IN KENYA

BY

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DECLARATION

This research project is my original work and has not been presented in any other university or institute of higher learning.

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This Research Project has been submitted for presentation with my approval as University Supervisor.

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DEDICATION

I dedicate this research project to God Almighty for the gift of life and to my family for their unconditional sacrifice, love, encouragement and support during the entire course of the MBA program.

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TO ALL, I REMAIN FOREVER GRATEFUL

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

ATM   Automatic Teller Machine

CBs   Commercial Banks

CBK   Central Bank of Kenya

E-banking   Electronic Banking

GP   General Profitability

ICT   Information Communication Technology

M-Banking   Mobile Banking

M-Finance   Mobile Finance

M-Payment   Mobile Payments

MFS   Mobile Financial Services

PDA   Personal Digital Assistant

ROA   Return on Assets

ROI   Return on Installation

R & D   Research and Development

RTGS   Real Time Gross Settlement

SME   Small and Medium Enterprises

WAP   Wireless Application Protocol

ABSTRACT

Mobile banking offers customers an easy access to financial services by minimizing time and distance to the nearest retail bank branches associated with traditional banking. Mobile banking has been beneficial to both the banks and customers as it reduces the banks overheads and transaction- related costs and its convenient and cheap as lesser fees are charged on mobile transactions. The advent of M-banking was as a result of the competition from telecommunication industry mainly Safaricom with their Mpesa services and Airtel's money transfer services. It also allows customers of a financial institution to conduct balance inquiry, credit transfers, paying bills through a mobile device which has increased convenience to customers. The study applied descriptive research design. The target population was the 43 commercial banks operating in Kenya as at December 2014. The total amounts transferred through mobile banking for the past five years were collected and the number of active mobile banking users was regressed against bank performance as measured by the return on assets. The study used secondary data from the Central bank of Kenya and Kenya National Bureau of Statistics. Analysis involved multiple regressions of variables under study. From the regression model of 5 years the study found a positive relationship between mobile banking and banks profitability. The study results show that Mobile Banking has an influence on profitability of commercial banks in Kenya. Based on the summary of the major findings of the study it can be concluded that mobile banking offers banks several opportunities for increasing revenues. The study recommends that commercial banks should therefore continue to adopt new technologies which will improve their profitability. Policy makers should also consider mobile banking in their formulation of policies because of the technological developments and the expected switch from physical branch networks to technologically supported banking services that will improve profitability which will convert to better tax revenues for the government. The study also recommends an increase in agency banking network in the country, to tap on the unbanked populations since agency banking also had a positive impact on banks profitability.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The purpose of this study was to analyze the effect of mobile banking on profitability of commercial banks in Kenya. Profitability is the efficiency of a company at generating more earnings than expenses incurred over the same period under consideration. The introduction of mobile banking has revolutionized and redefined how banks are operating. It has increased the competition amongst banks as they are offering more modern ways of banking and efficient services which determine the impact on the banks profitability and it has led to decreased costs especially on labor costs which positively influence profits generated.

Managers of these banks will have to determine the factors which lead to the success of their operations and also the ability to manage risks of using mobile banking such as hackers, fraud and how they will differentiate the services available in the mobile banking platform in order to have a competitive advantage in the market. They need to look at the infrastructure supporting m-banking platform especially the cellular service providing companies which are very vital for the success of mobile banking technology. Therefore, the study was to determine if mobile banking has an effect on profitability generated by commercial banks in Kenya

1.1.1Mobile Banking

Mobile banking is categorized as the latest development in electronic banking and it is a kind of electronic banking that applies Short Message System (SMS) and Wireless

Application Protocol (WAP) services to facilitate customers in making online transactions (Lee & Benbasat, 2003). Banking was in the recent past meant for a few people in Kenya especially due to high bank fees, untailored bank products and services and limited geographical reach (Chogi, 2006). The developments in the banking sector have seen increased number of users of banking services. A number of banks have innovated various M-banking products for example Equity bank M-kesho, KCB Mobibank, Family bank Pesa pap, Cooperative bank's M-Coop Cash and Commercial bank of Africa's M-swari.

Mobile banking offers customers an easy access to financial services by minimizing time and distance to the nearest retail bank branches associated with traditional banking. Mobile banking has been beneficial to both the banks and customers as it reduces the banks overheads and transaction- related costs and its convenient and cheap as lesser fees are charged on mobile transactions. The advent of M-banking was as a result of the competition from telecommunication industry mainly Safaricom with their Mpesa services and Airtel's money transfer services. It also allows customers of a financial institution to conduct a number of financial transactions including balance inquiry, credit transfers, paying bills among other transactions (Saleem & Rashid, 2011) through a mobile device such as mobile phone or personal digital assistant (PDA) which has increased convenience to customers.

The adoption of new technologies improves efficiency, leads to growth in customer base, reduce transactions costs and time, improve service delivery and general improvement in performance and hence growing businesses and increased profitability which has encouraged a cashless society. The service delivery evolution has been witnessed by

customers moving away from the traditional interpersonal service encounter to technology-based self-service which according to Asongu (2012), provides benefits to both the bank, as it reduces the transaction costs leading to increase in profits and to the customer there is increased convenience.

1.1.2 Profitability of Commercial Banks in Kenya

Profit is the ultimate goal of commercial banks and all the strategies designed and activities performed thereof are meant to realize this objective. Commercial banks play a key role in the economic resource allocation of any country as they channel funds from depositors to investors on a day to day basis. This role is possible when they are able to generate necessary income to cover operational cost they incur in the whole process. Furthermore, for a sustainable intermediation role of commercial banks, they need to be profitable since profits rewards investors for their investments in turn encourages additional investment and brings about economic growth of a country. On the other hand, poor banking performance can lead to banking failure and crisis which have negative impact on the economic growth of a country (Marshall, 2009).

Profits of banks are majorly from the fees they charge for services provided and from interest earned on the banks assets such as loans and securities they hold. To drive customer loyalty and bank profitability, banks will have to understand customer willingness to pay by looking keenly on proper pricing of their products and services at the same time provide secure, accessible and differentiated products and services to serve different customer needs. The common measures of banks profitability includes return on assets (ROA), return on equity (ROE), Net Interest Margin (NIM), Market power, efficiency and capitalization (Murthy & Sree, 2003). The ability of banks to deliver

products and services in the most effective and efficient manner, will therefore be the key to performance. Mobile banking serves to give the customers a new easier, convenient and quick approach to banking which most commercial banks are competing on to attract the largest customer base and in turn be able to increase profits.

A key consideration relating to bank profit maximization relates to the concepts of risk and diversification. Banks performance is related to changes in the environment and the behavior of competitors. Mobile banking is being viewed by the Commercial Banks managers and other stakeholders as being the long term solution to the increasing number of customers, changes in demand and customer preferences in terms of service delivery, competition, cost reduction and revenue management and also improved general performance. However, cost reduction is only realizable with an increase in customer adoption (Bradley and Stewart, 2003).Financial Institutions which have had difficulty providing profitable services through traditional channels which were more labor intensive see an opportunity in mobile banking as a form of branchless banking (Ivatury and Mas, 2008). The new entrants in the market especially the non-depository and non-financial institutions have increased competition for consumer deposits as they are offering services substitutable to those offered by commercial banks (Goro, 2003). Such institutions include micro finance institutions, Saccos and telecommunication industry such as Safaricom and Airtel.

1.1.3 Relationship between Mobile Banking and Profitability

Use of financial innovation can contribute to improved bank performance by increasing banks market share, expand products range and customized products, improving service delivery, reducing banks overheads and transaction related costs and increasing the

geographical reach all which contribute to profitability (Lee, Lee and Kim, 2009).Simpson (2002) suggested that e-banking is driven largely by the prospects of operating costs minimization and operating revenues maximization. A comparison of online banking in developed and emerging markets revealed that in developed markets lower costs and higher revenues are more noticeable.

The application of information and communication technology concepts, techniques, policies and implementation strategies to banking services has become a key concern to all banks and indeed a requirement for local and global competitiveness banking (Sullivan, 2000). The degree of competition in the banking industry matters for the efficiency of production of financial services, the quality of financial products and the degree of innovation in the sector (Claessens, 2009). Banks need to have sufficient capital and be diversified enough to absorb major shocks whilst remaining sufficiently competitive to provide consumers with reasonably priced services. They also have to ensure that they improve their network coverage, have quality connections and reduced costs as a way of gaining a competitive advantage in the market (Kigen, 2010).Although the rapid development of information technology has made some banking services more efficient and cheaper, technological investments are taking a larger share of banks resources. Regardless of the many concerns on banking innovations, a positive relationship exists between mobile banking and bank performance.

1.1.4 Commercial Banks in Kenya

According to the CBK 2013 report, there are forty four banking institutions in Kenya (forty three commercial banks and one mortgage company). There are also four offices of foreign banks, six Deposit taking Micro-finance Institutions (DTMs), one hundred and

eighteen Forex Bureaus and two Credit Reference Bureaus (CRBs). Out of the forty four banking institutions, thirty one are locally owned whereby three have public shareholding and twenty eight are privately owned and thirteen are foreign owned comprising of nine locally incorporated foreign banks and four branches of foreign incorporated banks. The commercial banks control the financial sector in Kenya and therefore any failure in the sector has serious implication on the country's economy. This is due to the fact that any bankruptcy in the financial sector can lead to bank runs, crises and bring overall financial crisis and economic meltdown (Marshall, 2009).

Kenya experienced significant expansion in its financial sector infrastructure over the period of 2006-2008 this resulted in a 46 percent increase in bank branches, from a total of 581 in 2006 to 849 in 2008 according to (Central Bank of Kenya 2007, 2009) report. The net effect of this branch expansion, together with wider economic growth in Kenya was to increase the proportion of Kenyan adults with access to formal financial services from 16 percent in 2006 to 24 percent in 2009. According to an annual report by Central Bank of Kenya (CBK), mobile banking adoption and usage has surpassed Automated Teller Machine (ATMs) in the last few years (CBK 2014). Currently, there are about 8 million users of M-banking services compared to 4 million people who hold accounts in conventional financial institutions in Kenya (CBK 2014). The tremendous increase in number of people adopting M-banking has been attributed to ease of use and high number of mobile phone users. This is consistent with the theory of consumer choice and demand as conceptualized in Kauffman (2008) in relation to mobile payments. The rapid expansion in the adoption of mobile banking in Kenya can help achieve greater financial

inclusion by bringing increasingly sophisticated and lower cost services to rural communities.

1.2 Research Problem

Some theories support the relationship between mobile banking, profitability and competitiveness of commercial banks in Kenya. Transaction cost theory explains the role of transaction costs in increasing profitability and competitiveness of banks. Through mobile banking, there has been a tremendous reduction on transactions costs with banks introducing low fee accounts and integrating banking services with mobile money products all which have a positive impact on transaction costs (Ivatury & Mas, 2008). The theory of financial intermediation is supported by the adoption of agency banking by banks that has seen more customers' access to fast, efficient and convenient banking services by extending geographical reach of banks (Scholtens & Wenseveen, 2003). Attracting more customers means banks will increase their profits. The diffusion of innovation theory talks about the mobile banking innovation by banks and explains how it impacts on profitability and competitiveness of commercial banks. Through innovation banks have integrated with mobile phones service providers who have a large number of customers and they can take advantage to attract these customers to the mobile banking platform in turn increase their profits and at the same time it will have a negative impact on costs.

The banking sector in Kenya has experienced turbulent times following the collapse of many banks in the 1990s only financial institutions that are able to adapt to the changing environment and to new ideas and business methods will survive. In 2012, the CBK allowed regulated deposit taking microfinance institutions to operate not only through

third party agents but to operate licensed agencies as a way of facilitating further financial deepening. Technological innovation has a direct influence on performance improvement (Berger, 2003). In order to minimize their operational costs, commercial banks have adopted internet banking, agency banking and mobile banking where customer can access their accounts on their personal computers, mobile phones and through numerous mobile agents opened countrywide. All these models are geared towards leveraging the operating costs of commercial banks. But how well do these models influence the profitability of banks?

Although mobile banking yields enormous benefits, some scholars found that mobile banking adoption among banks and customers remains small (Donner & Tellez,2008). Furthermore, Kleijnen et al. (2007) further indicated that the usage of mobile banking has yet to meet competitive expectations. Porteous (2006) argues that as unbanked people start to use mobile phones they become reachable at a lower cost and therefore more bankable in the sense that a basic transactional service becomes more viable to offer via the phone, hence his emphasis on cost. Despite the fact that numerous mobile banking adoption studies have been investigated by Luam and Lin (2005) and Zhou et al. (2010), most of them were conducted in countries such as Korea, Brazil, Taiwan and China with relatively little attention paid to developing countries like Kenya. All of these studies show varying results and this study therefore intends to fill this gap in a local context.

Locally, various studies have been conducted on mobile banking. Wambari (2009) studied mobile banking in developing countries using a case of Kenya. The study sought to establish the importance of mobile banking in the day to day running of SMEs in Kenya and to understand the challenges involved in using m-banking as a business tool.

The study too elaborated that the adoption and use of mobile phones is a product of social process, embedded in social practices such as SMEs practices which leads to some economic benefits but he did not study its effect on profitability to commercial banks who will offer the service to these SMEs. Kigen (2010) studied the impact of mobile banking on transaction costs of microfinance institutions where he found out that by then, mobile banking had reduced transaction costs considerably though they were not directly felt by banks because of the then small mobile banking customer base. However, this study will consider the effect on profitability given that the number of mobile banking customer base has drastically increased compared to the time the study was done.

Following the mixed findings from prior studies and the evidence that not much research has been focused on the local context, this research will add to the existing knowledge by looking at the financial implication of mobile banking on the profitability of commercial banks in Kenya as a way of bridging the gap. For this to be realized, the study will seek to answer the question as to whether mobile banking influences the profitability of the commercial banks in Kenya.

1.3 Objective of the Study

The study's objective is to analyze the effect of mobile banking on profitability of commercial banks in Kenya.

1.4 Importance of the Study

The findings of this study will provide useful information to different stakeholders.

The study will enable managers of commercial banks to understand the impact of m-banking on profitability and also how it influences levels of competition amongst commercial banks hence the need to commit resources for research and development (R&D) to help improve on its financial performance. To the banks the study will help them understand the cost savings opportunities, the competitiveness advantages and improved general profitability accruing from the adoption of the technology. The study is also of significant importance to the customers to understand the flexibility, confidentiality, cost reduction and round the clock access of banking services advantages that accrue from the m-banking technology.

The study will provide useful information to the government and policy agencies (like the Central Bank of Kenya) on matters of policy formulation, taxation and regulation of the mobile banking services provided by commercial banks. The information from this research will also be of undeniable importance to the academics and potential researchers who are interested on further research on the subject as a reference material and in providing guidance on areas that require further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviews the various literatures that are related to the study and sentiments of various authorities in the area of study. Specifically, the chapter addresses the theoretical framework guiding the study, economic and financial effect of mobile banking on financial performance of commercial banks in Kenya, empirical literature and chapter summary. Theoretical literature in section 2.2 reviews the theories that help in understanding the study variables i.e. mobile banking, profitability and their relationship. Section 2.3 reviews the determinants of profitability of commercial banks and the relationships between mobile banking and other key variables 2.4 presents the empirical literature that review studies carried out in the past both local and international and finally section 2.5 provides a summary of the literature review.

2.2 Theoretical Literature

This part seeks to explore in depth the concept of mobile banking through a review of various theories that have informed this study. Specifically it consists, theories which govern financial performance of commercial banks in Kenya. It looks at previous studies on the basis of transaction cost theory which explains the role of transaction costs in increasing profitability and competitiveness of banks, theory of financial intermediation which deals with the intermediation role of financial institutions between deficit and surplus units in provision of financial services and diffusion of innovation theory which

talks about the mobile banking innovation by banks and explains how it impacts on profitability and competitiveness of commercial banks.

2.2.1 Diffusion of Innovation Theory

Mahajan and Peterson (1995) defined the diffusion of innovation as the process by which the innovation is communicated through certain channels over time among members of social systems. This theory examines the adoption and uses of information technology from a diffusion of innovation perspective through mobile banking. Kleijnen, et al(2007) stated that not all innovations are adopted it depends on the level of their input. According to Rogers (1995), the rate of adoption of new innovations depends on how an organization perceives its relative advantage, compatibility, triability, observability and complexity. He also argued that new technology presents risk for many customers who react differently based on their distinctive characteristics. Mobile banking has a more perceived relative advantage making its adoption faster especially due to the value it gives the banks in terms of profitability and reduced transaction costs as compared to traditional banking. The attribute of observability asserts that those which are less visible tend to diffuse slowly and vice versa. However, in mobile banking it is difficult to observe others using m-banking especially due to privacy and security reasons making this attribute less valuable to the study.

Compatibility with individual values, experience and banking needs on the other hand has a great influence on the adoption of mobile banking innovation. Mobile banking has seen a tremendous increase in its adoption by commercial banks due to its compatibility aspect with the mobile money systems (Dang, 2011). In collaboration with the telecommunication companies, banks are able to carry out mobile banking services to its

customers using mobile phones. Hence, this attribute is important when providing mobile banking services since compatible systems means stable systems that can be relied upon by customers at any time when carrying out banking transactions. The innovations that are simpler to understand and use are more likely to be adopted quickly. A mobile phone is a very user friendly device hence potential customers may feel that mobile banking system is less complex to use therefore are more likely to use m-banking services. Some scholars argue that perceived complexity of using a mobile phone has a negative impact on the attitude towards adopting or continuing to use mobile banking.

2.2.2 Transaction Costs Theory

Financial institutions, which have had difficulty providing profitable services through traditional banking see mobile financial services (MFS) as a form of branchless banking which lowers the costs involved in serving customers (Ivatury& Mas, 2008). This theory therefore explains why banks exist and why they expand to the external environment. Banks try to minimize the costs of exchanging their services to the external environment and also within the company. When external transaction costs are higher than the company's internal costs, then the company is expected to grow since it will be able to carry out its operations more cheaply (Coarse, 1977). Thus, transaction costs arise every time a product or service is being transferred from one end to another. Most efforts to increase financial access have focused on reducing transaction costs by introducing low fee accounts, extending the geographical reach of banks via agency banking and integrating banking services with mobile money products.

Low-cost banking can bring a considerable number of customers who formerly could be served only at a very high cost (Datta, Pasa, & Schnitker, 2001). According to Mallat

(2007), a transaction cost has a direct effect on consumer adoption if the cost is passed on to customers. Although the transaction costs of sending money through the mobile money technology are lower than those of banks and money transfer companies, still more people are adopting mobile banking especially due to its convenience which is a clear indicator that banks will continue to generate more profits from mobile banking services. Customer usage of mobile banking is influenced not only by absolute prices but by the way a service is priced (Rosenberg, 2010). Therefore banks can compete on such service costs. For instance, some banks offer free deposit service which make branchless banking an affordable way to save while in others charge a customer small fee in form of airtime or service charge when performing bank transaction. Thus, depending on how much cost the customers incur determines whether they are willing to pay thereby affecting adoption of mobile banking. It is still not clear that lowering transaction costs will always be beneficial with regard to the banks performance.

2.2.3   The Theory of Financial Intermediation

Financial intermediation occurs when surplus units deposit funds with the financial institutions who in turn lend to deficit units. Financial intermediaries are facilitators of risk transfer and deal with increasingly complex financial instruments and markets. The role of financial intermediaries is that of creating specialized financial commodities (Scholtens & Wenseveen, 2003). This is more likely whenever an intermediary expects to cover both direct and opportunity costs from the price given. However, this needs to be done in an economic way so as to minimize the operating costs and maximize the revenues for these banks. Financial intermediation theory brings out the role played by

mobile banking in the financial intermediation process by enabling the accessibility of banking services over the mobile phone

It's good to note that financial intermediation occurs only when the market is imperfect. When markets are perfect and complete, the allocation of resources is pareto efficient and there is no scope for intermediaries to improve welfare (Sullivan, 2000). The contrast between the theory and reality is in the area of risk management. The change in the breadth of the markets available for hedging risk has not led very many individual and corporate customers to manage their own risks; rather it has meant that risk management has now been the central activity of many intermediaries. Cases of informational asymmetries, moral hazards and adverse selection are the main reason why financial intermediaries are important to reduce such risks.

From the above suggested theories, transaction cost theory explains the role of transaction costs in increasing profitability and competitiveness of banks. Through mobile banking, banks have been able to reduce transactions costs by introducing low fee accounts and integrating banking services with mobile money products all which have a positive impact on transaction costs. Through the theory of financial intermediation, banks have adopted agency banking as a way of giving customers access to fast, efficient and convenient banking services by extending geographical reach of banks which will attract more customers and in turn increase profits. The diffusion of innovation theory explains that through innovation banks have integrated with mobile phones service providers who have a large number of customers and they can take advantage to attract these customers to the mobile banking platform in turn increase their profits and at the same time it has a negative impact on costs. All the above theories are in agreement that

mobile banking indeed has a positive relationship with profitability of commercial banks and this research will find out the effect of mobile banking on profitability of commercial banks in Kenya.

2.3 Determinants of Profitability of Commercial Banks

In the last decade, studies have shown that commercial banks in Africa have been more profitable compared to the previous decades (Flamini et al., 2009). One of the major reasons behind high return was investment in risky ventures and the existence of huge gap between the demand for bank service and the supply thereof. The profitability of commercial banks can be affected by internal and external factors (Al-Tamimi, 2010; Aburime, 2005). These factors can be classified into bank specific (internal) and macroeconomic variables. The internal factors are individual bank characteristics which affect the bank's performance and are influenced by the internal decisions of management. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the profitability of banks.

The internal factors include capital size, size of deposit liabilities, size and composition of credit portfolio, interest rate policy, labor productivity and state of information technology, risk level, management quality, bank size and ownership. The CAMEL framework is often used by scholars to substitute the bank specific factors (Dang, 2011). CAMEL stands for Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability and Liquidity. Capital influences the level of bank profitability and it is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation (Athanasoglou et al. 2005). Banks capital creates liquidity for the bank due to the fact that deposits are most delicate and prone to bank runs. On the other hand,

greater bank capital reduces the chance of distress (Diamond, 2000). According to Dang (2011), the adequacy of capital is judged on the basis of capital adequacy ratio (CAR). Capital adequacy ratio shows the internal strength of the bank to withstand losses during crisis. It has also a direct effect on the profitability of banks by determining its expansion to risky but profitable ventures or areas (Sangmi & Nazir, 2010).

The bank's asset also affects the profitability of a bank and it includes current asset, credit portfolio, fixed asset and other investments (Athanasoglou et al., 2005). The loan of a bank is the major asset that generates the major share of the banks income. The quality of loan portfolio determines the profitability of banks. The highest risk facing a bank is the losses derived from non-performing loans (Dang, 2011). Thus, nonperforming loan ratios are the best measures for asset quality and high nonperforming loan affects the profitability of the bank. The lower the ratio the better the bank performing (Sangmi & Nazir, 2010).Liquidity also determines the level of bank performance. According to Dang (2011) adequate level of liquidity is positively related with bank profitability. The most common financial ratios that reflect the liquidity position of a bank are customer deposit to total asset and total loan to customer deposits. However, from the studies conducted in China and Malaysia found that liquidity level of banks has no relationship with the performances of banks (Said and Tumin, 2011).

Management efficiency too determines the bank profitability and it is represented by different financial ratios like total asset growth, loan growth rate and earnings growth rate. Management quality determines the level of operating expenses and in turn affects profitability (Athanasoglou et al. 2005). The capability of the management to deploy its resources efficiently, income maximization, reducing operating costs can be measured by

17

financial ratios. One of this ratios used to measure management quality is operating profit to income ratio (Rahman et al. and Ihomovich, 2009; Sangmi & Nazir, 2010). The higher the operating profits to total income (revenue) the more the efficient management is in terms of operational efficiency and income generation. The other ratio is that of expense to asset ratio. The ratio of operating expenses to total asset is expected to be negatively associated with profitability. Management quality in this regard, determines the level of operating expenses and in turn affects profitability (Athanasoglou et al. 2005).

External factors that determine banks profitability include macroeconomic policy stability, Gross Domestic Product, Inflation, Interest Rate and Political instability. For instance, the trend of GDP affects the demand for banks asset. During the declining GDP growth the demand for credit falls which in turn negatively affect the profitability of banks. During boom the demand for credit is high compared to recession (Athanasoglou et al., 2005).

2.3.1 Mobile Banking and Profitability

According to Gakure and Ngumi (2013) in their study on the influence of innovations in profitability of commercial banks, results showed that bank innovations have a moderate influence on profitability of commercial banks in Kenya. The analysis produced a coefficient of determination of 47.8% which showed the percentage of variations in profitability which is explained by bank innovations. The significance test showed that influence of bank innovations on bank profitability was statistically significant. This means that the combined effect of the bank innovations in this research is statistically significant in explaining the profits of commercial banks in Kenya. Simpson (2002)

suggests that e-banking is driven largely by the prospects of operating costs minimization and operating revenues maximization. A comparison of online banking in developed and emerging markets revealed that in developed markets lower costs and higher revenues are more noticeable.

Tiwari, Buse and Herstatt (2006) studied mobile banking as business strategy, impact of mobile technologies on customer behavior and its implications for banks. The study sought to examine the opportunities for banks to generate revenues by offering value-added, innovative mobile financial services while retaining and even extending their base of technology-savvy customers. However, Sullivan and Richard (2000) in their research that they conducted in the US in Tenth District found no systematic evidence of the benefit of mobile banking in US banks profitability. Jayawardhena and Foley (2000) show that internet banking results in cost and efficiency gains for banks yet very few banks were using it and only a little more than half a million customers were using online banking in the United Kingdom (U.K).

Shirley and Sushanta (2006) studied the impact of information technology on the banking industry and analyzed both theoretically and empirically how information technology related spending can affect bank profits via competition in financial services that are offered by the banks. They found out that though IT might lead to cost saving, higher IT spending can create network effects lowering bank profits. They further contend that the relationship between IT expenditures and bank's financial performance is conditional to the extent of network effect. They say that if network effect is too low, IT expenditures are likely to reduce payroll expenses, increase market share, and increase revenue and profit. It is the mixed findings from prior studies that inform the decision to extend the

19

research to determine whether IT related banking services, specifically mobile banking have the potential of impacting on profitability of the commercial banks.

2.3.2 Mobile Banking and Competitiveness

Agboola (2006), in his study of thirty six out of eighty nine banks in Nigeria as at the end of 2005 on Information and Communication Technology (ICT) in banking operations in Nigeria using the nature and degree of adoption of innovative technologies; degree of utilization of the identified technologies and the impact of the adoption of ICT devices on banks, established that technology was the main driving force of competition in the banking industry. During the study he witnessed increase in the adoption of ATMs, EFT, smart cards, electronic home and office banking and telephone banking. He indicated that adoption of ICT improves the banks' image and leads to a wider, faster and more efficient market. He poses that it is essential for bank management to strengthen investment in ICT products to facilitate speed, convenience and accurate services or otherwise lose out to their competitors.

Policymakers and economists have argued that more competition in banking industry is associated with higher incentives to engage in more risky activities which will ultimately lead to an increase in profitability of banks. Hence, there is a trade-off between competition and mobile banking. Market power to a certain extent, raises the opportunity cost of bankruptcy, thus moderates risk taking incentives of banks and fosters the mobile banking system. The argument that a more competitive banking sector might endanger the mobile banking of the financial system has for so long been the key rationale for the restriction of competition in banking markets by regulators. They think that market power is beneficial for social welfare by reducing the probability of excessive risk taking and

consequently by decreasing systemic portfolio dynamism. As a result of this view, increase in market power has the potential to positively affect mobile banking due to asymmetric information, moral hazard and adverse selection problems on the part of borrowers and hence increase competition. Therefore, there exists no trade-off between competition and mobile banking in the banking sector (Berger, 2008).

Banks limit their risk taking in order to protect the quasi-monopoly rents granted by their government charters. Increased competition would erode these rents and the value of the charters, which would likely lead to greater bank risk taking and greater financial instability. For banks, profits that result from market power present in concentrated banking systems provide a buffer against adverse shocks and so increase the market value of the bank since investors' value more banks earning higher profits. Higher competition erodes market power and profit margins, thus reducing the incentives for prudent behavior leading to more aggressive risk taking in an attempt to earn higher profits (Keeley, 2012). Riskier policies increase the probability of higher non-performing loan ratios and more bank bankruptcies resulting in greater fragility and financial instability.

2.3.3 Mobile Banking Risks and Security

Security and trustworthiness of a service was identified as one of the most important factors within every target customer segment when deciding on the use of a banking service delivery channel. Security is the biggest challenge facing the mobile banking world. The use of wireless technology creates a risk that information will be stolen, therefore service providers have to employ the use of highly secure encryption technology to prevent third party data intrusion and losses. The mobility of the mobile handset and the nature of wireless communications make it difficult to authenticate a

customer, hence this becomes a security concern for both banks and their customers. Mattila (2002) contends that using mobile phone in banking is trustworthy. Early researchers' evidence and intuition alike suggests that trust plays a major role in use of the m-banking services (Porteous, 2007).

Ivatury& Pickens, (2006) have proposed modification to the technology acceptance model. They introduced a trust variable perceived credibility to predict m-banking adoption in Taiwan. Yet their modification also included another variable, self-efficacy and a form of trusting oneself. Generally, trust being a comprehensive concept may have to be handled carefully in any credible analysis of m-banking success (Benamati & Serva, 2007). People can trust the interface, the network across which their funds travel, the representatives of the institutions (channels) who control their money and/or the institutions themselves (Maurer, 2008). Mobile banking overview (January 2009) stated that, security issue must be addressed in order to encourage adoption of mobile banking in the following ways: data transmission must be secure in terms of confidentiality and therefore require encryption of the connection between the device and the bank. Application and data access must be controlled, whereby before users receive any sensitive information related to their bank accounts, a certain degree of verification must be completed

Fain and Roberts (1997) defines risk as a perception of consumer, not a characteristics of a product. It was found that the security factor could influence consumers' attitudes towards online banking (Laforet & Li, 2005). Furthermore, it was considered to be one of the greatest concerns in adoption of mobile banking services as individuals may worry about security issues during mobile banking service transactions such as data input and

output mechanisms, loss of connection risk and personal performance mistakes (Laukkanen & Lauronen, 2005; Kuisma et al., 2007). As a result, many people may decide not to use this service and ignore the extra benefits of using mobile banking. However, some previous studies have argued that, on the contrary, security issues were not major obstacles for consumers in adopting mobile banking (Suoranta, 2003; Laukkanen & Lauronen, 2005).

From the empirical literature discussed, some scholars were in agreement that technology was the main driving force of competition in the banking industry while other scholars argued that banks competed on service quality, transaction costs, convenience and flexibility of services. However, excessive competition in the banking industry was seen to increase the probability of excessive risk taking by banks which in the end may affect their financial performance. Others were not in agreement that mobile banking has an impact on profitability of commercial banks as they noted that high spending on technological innovations by commercial banks can lower bank profits especially if the rate of adoption by users is not that fast, although the studies were done on global context therefore this research intends to bridge this gap by looking at the local context to determine the effect of mobile banking on profitability of commercial banks in Kenya.

2.4 Empirical Literature

An empirical study is a research work carried out with a view to establishing whether a certain theory or relationship holds or does not hold. Simpson (2002) suggests that e-banking is driven largely by the prospects of operating costs minimization and operating revenues maximization. A comparison of online banking in developed and emerging markets revealed that in developed markets lower costs and higher revenues are more

noticeable. However, Sullivan and Richard, (2000) in their research that they conducted in the US in Tenth District found no systematic evidence of the benefit of mobile banking in US banks.

Tiwari, Buse and Herstatt (2006) studied mobile banking as business strategy: impact of mobile technologies on customer behavior and its implications for banks. The study sought to examine the opportunities for banks to generate revenues by offering value-added, innovative mobile financial services while retaining and even extending their base of technology-savvy customers. Athanasoglou, et al.(2006) study the profitability behavior of the south eastern European banking industry over the period 1998–2002. The empirical results suggest that the enhancement of bank profitability in those countries requires new standards in risk management and operating efficiency, which, according to the evidence presented in the paper, crucially affect profits. A key result is that the effect of market concentration is positive, while the picture regarding macroeconomic variables is mixed.

Donner and Tellez (2008) did a study on mobile banking and economic development where they sought to link adoption, impact, and use. The study established that through offering a way to lower the costs of moving money from place to place and offering a way to bring more users into contact with formal financial systems, m-banking/m-payments systems could prove to be an important innovation for the developing world. However, the true measure of that importance required multiple studies using multiple methodologies and multiple theoretical perspectives before answering the questions about adoption and impact.

Al-Jabri (2012) studied mobile banking adoption by looking at the application of diffusion of innovation theory. This study sought to investigate a set of technical attributes and how they influence mobile banking adoption in a developing nation, like Saudi Arabia. The study used diffusion of innovation as a base-line theory to investigate factors that may influence mobile banking adoption and use. More specifically, the objective of this research was to examine the potential facilitators and inhibitors of mobile banking adoption. The study was guided by six hypothesis including: relative advantage having a positive effect on mobile banking adoption; Complexity having a negative effect on mobile banking adoption; Compatibility having a positive effect on mobile banking adoption; Observability having a positive effect on mobile banking adoption; Trialability having a positive effect on mobile banking adoption; and perceived risk having a negative effect on mobile banking adoption. The findings suggest that banks, in Saudi Arabia, should offer mobile banking services that are compatible with various current user requirements, past experiences, lifestyle and beliefs in order to fulfill customer expectations.

Locally, various studies have been conducted on mobile banking. Wambari (2009) studied mobile banking in developing countries using a case of Kenya. The study sought to establish the importance of mobile banking in the day to day running of small businesses in Kenya and to understand the challenges involved in using m-banking as a business tool and appreciate the advantages and disadvantages therein. The study too elaborated that the adoption and use of mobile phones is a product of social process, embedded in social practices such as SMEs practices which leads to some economic

benefits. This research will look into the importance of mobile banking to commercial banks in Kenya.

Munaye (2009) studied the application of mobile banking as a strategic response by equity bank Kenya limited to the challenge in the external environment. Munaye (2009) reviewed the concept of mobile banking as a strategic response where its effects on financial performance were not considered.

Kigen (2010) studied the impact of mobile banking on transaction costs of microfinance institutions where he found out that by then, mobile banking had reduced transaction costs considerably though they were not directly felt by banks because of the then small mobile banking customer base. He sought to determine the impact that mobile banking had on transaction costs of microfinance institutions as a way of measuring levels of competitiveness on micro finance institutions who had adopted mobile banking whereas this study is set to determine the impact of mobile banking on competitiveness of Commercial Banks.

Kingoo (2011) studied the relationship between electronic banking and financial performance of commercial banks in Kenya. He paid key attention on the microfinance institutions in Nairobi and looked at the wider electronic banking. This study focused on the profitability variable of mobile banking on microfinance institutions while this study will only concentrate on mobile banking on commercial banks in Kenya.

From the empirical literature discussed, some scholars were not in agreement that mobile banking has an impact on profitability of commercial banks as they noted that high spending on technological innovations by commercial banks can lower bank profits

especially if the rate of adoption by users is not that fast and this research intends to bridge this gap by looking at the impact of mobile banking on profitability. Locally, the researchers reviewed the impact of mobile banking on performance of commercial banks, SMEs and micro finance institutions, where they agreed that mobile banking had an impact on performance of these financial institutions but they did not look at the profitability aspect of commercial banks and this research intends to fill the gap by looking at the effect of mobile banking on profitability of commercial banks in Kenya.

2.5 Summary of Literature Review

This chapter started by looking at the theoretical framework where it discussed the theories on which the study is found. The transaction cost theory explained the role of transaction costs in increasing profitability and competitiveness of banks. Through mobile banking, banks have been able to reduce transactions costs by introducing low fee accounts and integrating banking services with mobile money products all which have a positive impact on transaction costs. Through the theory of financial intermediation, banks have adopted agency banking as a way of giving customers access to fast, efficient and convenient banking services by extending geographical reach of banks which will attract more customers and in turn increase profits. Banks will have to differentiate their products and services in order to have a competitive advantage. The diffusion of innovation theory talks about the mobile banking innovation by banks and explains how it impacts on profitability and competitiveness of commercial banks. Through innovation banks have integrated with mobile phones service providers who have a large number of customers and they can take advantage to attract these customers to the mobile banking

27

platform in turn increase their profits and at the same time it has a negative impact on costs.

From the empirical literature discussed, globally some scholars were not in agreement that mobile banking has an impact on profitability of commercial banks as they noted that high spending on technological innovations by commercial banks can lower bank profits especially if the rate of adoption by users is not that fast. Also excessive competition in the banking industry was seen to increase the probability of excessive risk taking by banks which in the end may affect their financial performance. In the local context, researchers reviewed the impact of mobile banking on performance of commercial banks, SMEs and micro finance institutions, where they agreed that mobile banking had an impact on performance of these financial institutions but they did not look at the profitability aspects of commercial banks. Following these mixed findings on the impact of mobile banking on financial performance of commercial banks, this study aims to bridge this gap by looking on the effect of mobile banking on profitability of commercial banks in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on the research methodology that was used to conduct the study. Section 3.2 describes the research design which explains the methodology that was applied by the study and section 3.3 looks at the population and sample. Section 3.4 focuses on data and data collection instruments whereby secondary data was used and finally section 3.5 looks at data analysis.

3.2 Research Design

According to Mcmillan and Schumaker (2001) a research design is a plan for selecting subjects, research sites and data collection procedures to answer the research questions. The research design used was a descriptive research design since it is concerned with the what, where and how of a phenomenon hence more placed to build a profile on that phenomenon (Mugenda & Mugenda, 2003). This design method was designed to provide further insight into the research problem by describing variables of interest and the relationship between variables (Bryman & Bell, 2003) and therefore conclude on the impact it has on profitability. It also helped to map out circumstances, situations or events to describe what is happening or what happened (Creswell, 2002).

3.3 Population and Sample

Ngechu (2004) defines a population as a well-defined or set of people, services, elements, and events, group of things or households that are being investigated. The target population of the study comprised the forty three commercial banks operating in Kenya

and all the forty three banks formed the sample size. The researcher collected the data from all commercial banks who had adopted mobile banking technology.

3.4 Data and Data Collection Instruments

This research being descriptive in nature, it used secondary data. Secondary data is the information that has been collected by others (Saunders, Lewis and Thornhill, 2009). The data was collected from published audited financial statements of Commercial Banks from the year 2010 to 2014, Kenya Bureau of Statistics and CBK database to enable in measuring profitability of commercial banks. The data was then edited, coded and cleaned. To validate the instruments a thorough scrutiny was conducted to ensure that the findings truly represent the phenomenon measured.

3.5 Data Analysis and Presentation

Bryman and Bell (2003) defined data analysis as a technique used to make inferences from data collected by means of a systematic and objective identification of specific characteristics. The dependent variable was measured to see how it varies with changes in independent variables. The dependent variable in the model specified was the profitability of commercial banks which was measured by using ratios since they are inflation invariant. The total amounts transferred through mobile banking for the period 2010-2014 was analyzed and the number of mobile banking users was regressed against banks performance as measured by the ROA.

3.5.1 Analytical Model

The researcher conducted a multiple regression analysis using the following regression model.

$$Y = Bo + B_1 X1 + B_2 X2 + B_3 X3 + \varepsilon \tag{1}$$

Where;

Y=Banks performance as measured by ROA

X_1=Annual amounts moved through mobile banking platform

X_2=Number of active users of mobile banking

$X3$=Contribution of agency banking to income generated by commercial banks

ε = Error term

Bo=Constant

$B1$, $B2$, $B3$= slope that will show the relationship between dependent and independent variables.

The study used excel and Statistical Package for Social Sciences version to aid in data analysis. The t-test was used to determine the relative sensitivity of each variable in affecting the performance of banks and as a test of significance which will be at 5% level of significance. This model is supported by Kigen (2010) who analyzed the impact of mobile banking on transaction costs of microfinance institutions by looking at mobile banking adoption and the behavior of transaction costs where he established that mobile banking reduced transaction costs considerably though it was not felt by banks directly due to the small number of mobile banking customers then.

Data gathered was coded and tabulated using the descriptive statistics. In order to test the strength of the model and the effect of mobile banking on profitability of commercial banks in Kenya, the researcher conducted an Analysis of Variance (ANOVA). This analysis helped the researcher in looking at the significance value. The study tested 95% confidence level and 5% level of significance.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter discusses the interpretation and presentation of the findings. The chapter presents analysis of the data to determine the effect of mobile banking on profitability of commercial banks in Kenya. It also provides the major findings and results of the study. Section 4.2 looks at descriptive statistics while section 4.3 analyses the regression model. Finally section 4.4 provides the summary and interpretation of findings.

4.2 Descriptive Statistics

Table 4. 1: Summary of the Study Variables for the Study Period

	2010	2011	2012	2013	2014	Mean	Standard Deviation
Annual amount of money moved through mobile banking	3,221,5 80,791	3,979,756 ,349	4,829,64 2,698	6,472,0 49,977	6,529,57 9,945	5,006,52 1,952.00 00	1,478,092, 255.60629
Number of users of Mobile Banking	12262	14723	20352	22716	26069.2	19224.44 00	5680.0452 3

| Contribution of agency banking to income generated | 1,073,865,021 | 994,943,270.8 | 1,609,888,354 | 2,157,358,235 | 2,704,828,116 | 1,708,176,599.36 00 | 727,288,100.75570 |

According to the findings in Table 4.1 the annual amount of money moved through mobile banking has been on an increasing trend since the year 2010, 2014 had the highest figure at 6,529,579,945, the number of users of mobile banking too has been on an upward trend since 2010 with a 26,069 users in 2014. On the other hand contribution of agency banking to income generated during the period of study with the peak of capital adequacy being 2014 at 2,704,828,116.

4.3 Regression Analysis

In this study, a multiple regression analysis was conducted to test the relationship among predictor variables. The research used statistical package for social sciences (SPSS V 21.0) to code, enter and compute the measurements of the multiple regressions.

Table 4. 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.847	0.717	0.707	0.573

R-Squared is a commonly used statistic to evaluate model fit. R-square is 1 minus the ratio of residual variability. The adjusted R^2, also called the coefficient of multiple

determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables. 70.7% of the profitability of commercial banks in Kenya could be attributed to the combined effect of the predictor variables.

Table 4. 3: Summary of One-Way ANOVA results between profitability and the predictor variables

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.215	2	2.241	6.342	0.016
	Residual	28.497	12	0.673		
	Total	34.712	14			

The probability value of 0.016 indicates that the regression relationship was highly significant in predicting how mobile banking affect profitability of commercial banks in Kenya. The F calculated at 5% level of significance was 6.342 since F calculated is greater than the F critical (value = 3.885), this shows that the overall model was significant.

Table 4. 4: Regression coefficients of the relationship between mobile banking and profitability of commercial banks in Kenya

	Unstandardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**

1	(Constant)	1.074	0.216		2.891	5.32E-04
	Annual amount of money moved through mobile banking	0.674	0.151	0.615	5.311	1.51E-05
	Number of users of Mobile Banking	0.741	0.183	0.151	3.212	2.10E-04
	Contribution of agency banking to income generated	0.575	0.198	0.236	4.257	6.18E-05

As per the SPSS generated table above, the equation ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$) becomes:

$Y = 1.074 + 0.674 X_1 + 0.741 X_2 + 0.575 X_3$

The regression equation above has established that taking all factors into account (annual amount of money moved through mobile banking, number of users of mobile banking, capital adequacy and contribution of agency banking to income generated) constant at zero profitability of commercial banks in Kenya will be 1.074. The findings presented also show that taking all other independent variables at zero, a unit increase in the annual amount of money moved through mobile banking would lead to a 0.674 increase in the scores of profitability of commercial banks in Kenya, a unit increase in the scores of number of users of mobile banking would lead to a 0.741increase in the scores of profitability of commercial banks in Kenya, a unit increase in the scores of contribution

of agency banking to income generated would lead to a 0.575 increase in the scores of profitability of commercial banks in Kenya.

Overall, number of users of Mobile Banking had the greatest effect on profitability of commercial banks in Kenya, followed by number annual amount of money moved through mobile banking while contribution of agency banking to income generated had the least effect on profitability of commercial banks in Kenya. All the variables were significant ($p<0.05$).

4.4 Summary and Interpretation of Findings

From the above regression model, the study found out that there were mobile banking variables influencing the profitability of commercial banks in Kenya. They include annual amount of money moved through mobile banking, number of users of mobile banking and contribution of agency banking to income generated. They influenced mobile banking positively. The study found out that the intercept was 1.074 for all years.

The three independent variables that were studied (annual amount of money moved through mobile banking, number of users of mobile banking and contribution of agency banking to income generated) explain a substantial 70.7% of profitability of commercial banks in Kenya as represented by adjusted R^2 (0.707). This therefore means that the three independent variables contributes 70.7% of the profitability of commercial banks in Kenya while other factors and random variations not studied in this research contributes averagely 29.3% of the profitability of commercial banks in Kenya.

The study established that the coefficient for annual amount of money moved through mobile banking was 0.674, meaning that annual amount of money moved through mobile

banking positively and significantly influenced the profitability of commercial banks in Kenya. This is in line with Gakure and Ngumi (2013) who showed that combined effect of the bank innovations research is statistically significant in explaining the profits of commercial banks in Kenya. In addition, Simpson (2002) expressed that mobile banking is driven largely by the prospects of operating costs minimization and operating revenues maximization and that a comparison of mobile banking in developed and emerging markets revealed that in developed markets lower costs and higher revenues are more noticeable.

The study also established that the coefficient for number of users of mobile banking was 0.741, meaning that number of users of mobile banking positively and significantly influenced the profitability of commercial banks in Kenya. This correlates with Mattila (2002) findings that using mobile phone in banking is trustworthy. Agboola (2006) people trust the interface, the network across which their funds travel, the representatives of the institutions (channels) who control their money and/or the institutions themselves. On the other hand, Jayawardhena and Foley (2000) also showed that internet banking results in cost and efficiency gains for consumers and banks yet very few banks were using it and only a little more than half a million customers were using online banking in the United Kingdom (U.K). In addition, Donner and Tellez (2008) established that through offering a way to lower the costs of moving money from place to place and offering a way to bring more users into contact with formal financial systems, m-banking/m-payments systems could prove to be an important innovation for the developing world.

The study further revealed that the coefficient contribution of agency banking to income generated was 0.575, meaning that contribution of agency banking to income generated positively and significantly influenced the profitability of commercial banks in Kenya. This concur with Agboola (2006) that technology was the main driving force of competition in the banking industry and it is essential for bank management to strengthen investment in ICT products through agency baking to facilitate speed, convenience and accurate services or otherwise lose out to their competitors. Wambari (2009) also contend that the adoption and use of mobile phones is a product of social process, embedded in social practices such as SMEs practices which leads to some economic benefits.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary, conclusion and recommendations of the main findings on the relationship between mobile banking and profitability of commercial banks in Kenya. The conclusions and recommendations made address the objective of the study which sort to determine the effect of mobile banking on profitability of commercial banks in Kenya. Section 5.2 discusses the summary of the findings on the study and section 5.3 looks at the conclusions made from the study. While section 5.4 discusses the limitations of the study and finally section 5.5 looks at the recommendations for further research.

5.2 Summary of the Study

Mobile banking is categorized as the latest development in electronic banking and it is a kind of electronic banking that applies Short Message System (SMS) and Wireless Application Protocol (WAP) services to facilitate customers in making online transactions. The developments in the banking sector have seen increased number of users of banking services as it allows customers with busy lives to conveniently do their banking using their phones anytime. It is about getting banking services to the unbanked, those who do not have bank access or bank accounts and those who are at the bottom of the economic pyramid, often living in remote areas. The innovative National Industrial Corporation (NIC) mobile banking platform promises a number of 'firsts' within the banking industry and Information Technology fields. The study sought to determine the effect of mobile banking on profitability of commercial banks in Kenya. Descriptive

research design was employed in this case. This informed who, how and what about the mobile banking in commercial banks in Kenya and as a one-time event. The target population of the study comprised the forty three commercial banks operating in Kenya and all the forty three banks formed the sample size.

The study made use of secondary data from the Audited Financial statements of the Banks, those deposited at the Nairobi Securities Exchange and profitability data from CBK annual banking survey reports. The data collected was cleaned, coded and systematically organized in a manner that facilitates analysis using the Statistical Package for Social Sciences (SPSS) version 21.0. Quantitative analysis was analyzed through descriptive statistics such as measure of central tendency that generated relevant frequency counts, mode, and median, mean and standard deviation where possible. To test for the strength of the model and the effects of mobile banking on the profitability of commercial banks in Kenya, the study conducted an Analysis of Variance (ANOVA). From the regression model, the study found out that there were mobile banking variables influencing the profitability of commercial banks in Kenya, which are annual amount of money moved through mobile banking, number of users of mobile banking and contribution of agency banking to income generated. They influenced it positively. The study found out that the intercept was 1.074 for all years. The three independent variables that were studied (annual amount of money moved through mobile banking, number of users of mobile banking and contribution of agency) explain a substantial 70.7% of profitability of commercial banks in Kenya as represented by adjusted R^2 (0.707). The study therefore concludes that mobile banking positively and significantly affects the profitability of commercial banks in Kenya.

41

5.3 Conclusions

The study concludes that annual amount of money moved through mobile banking positively and significantly influenced the profitability of commercial banks in Kenya. This could be credited to the trends recorded in the variable where the annual amount of money moved through mobile banking had a positive and significant influence to profitability of commercial banks in Kenya. This correlates with Gakure and Ngumi (2013) who showed that combined effect of the bank innovations research is statistically significant in explaining the profits of commercial banks in Kenya. In addition, Simpson (2002) expressed that mobile banking is driven largely by the prospects of operating costs minimization and operating revenues maximization and that a comparison of mobile banking in developed and emerging markets revealed that in developed markets lower costs and higher revenues are more noticeable.

The study also concludes that the number of users of mobile banking positively and significantly influenced the profitability of commercial banks in Kenya. This could be attributed to the trends recorded in the variable where number of users of mobile banking had a positive and significant influence to profitability of commercial banks in Kenya. This is in line with Mattila's (2002) findings that using mobile phone in banking is trustworthy. Agboola (2006) also expressed that people trust the interface, the network across which their funds travel, the representatives of the institutions (channels) who control their money and/or the institutions themselves. In addition, Donner and Tellez (2008) established that through offering a way to lower the costs of moving money from place to place and offering a way to bring more users into contact with formal financial systems, m-banking/m-payments systems could prove to be an important innovation for

the developing world. This therefore means that the more clients a bank has in the mobile banking platform and the higher the amount of money transacted through mobile banking the better the profitability of a commercial bank.

The study finally concludes that contribution of agency banking to income generated positively and significantly influenced the profitability of commercial banks in Kenya. These findings concur with Agboola (2006) that technology was the main driving force of competition in the banking industry and it is essential for bank management to strengthen investment in ICT products through agency baking to facilitate speed, convenience and accurate services or otherwise lose out to their competitors. Wambari (2009) also contend that the adoption and use of mobile phones is a product of social process, embedded in social practices such as SMEs practices which leads to some economic benefits.

5.4 Limitations of the Study

The main limitations of this study were: the data used was secondary data generated for other purposes hence may not accurately predict the relationship among the variables. The measures used may keep on varying from one year to another subject to the prevailing condition. For example the profitability of commercial banks was subject to the total assets owned by commercial banks. In addition, changes in the macroeconomic environment could have affected the profitability of commercial banks e.g. inflation and GDP.

Another limitation for the study included the short period which mobile banking has been in existence which could not give a long trend for analysis. Mobile banking was only

introduced in Kenya by March 2007. It has only been six years since the launch which may not give a clear picture of the relationship as not all commercial banks adopted mobile banking at ago yet the performance used in the study takes into account the performance from all banks.

5.5 Recommendations for Further Research

From the findings, the study established that agency banking also impacted on the profitability of commercial banks in Kenya over the 5year period. Therefore the study recommends that for the commercial banks to further enhance their profitability, the management of the commercial banks in Kenya should increase the agency banking network in the country, more so to the remote areas lacking banks' branch network to tap on the unbanked populations.

The study also recommends that policy makers consider mobile banking in their formulation of policies because of the technological developments and the expected switch from physical branch networks to technologically supported banking services. This is because despite negligible relationship between mobile banking and profitability of commercial banks in Kenya, the impact could be pronounced if much change is recorded in technological developments and more customers adopt mobile banking services. This is because the relationship may not be direct but an indirect one resulting from the convenience that the mobile banking services offers to commercial banks.

Furthermore, the study established that mobile banking positively impacted on the profitability of commercial banks in Kenya over the 5year period. Therefore the study recommends that the management of the commercial banks in Kenya should partner with

the telecommunication players to achieve synergy in broadening and accelerating the adoption of mobile banking in Kenya for enhanced financial performance.

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APPENDICES

Appendix I:List of Commercial Banks in Kenya

1. ABC Bank (Kenya)
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank Kenya
6. CfCStanbic Holdings
7. Chase Bank Kenya
8. Citibank
9. Commercial Bank of Africa
10. Consolidated Bank of Kenya
11. Cooperative Bank of Kenya
12. Credit Bank
13. Development Bank of Kenya
14. Diamond Trust Bank
15. Ecobank Kenya
16. Equatorial Commercial Bank
17. Equity Bank
18. Family Bank
19. Fidelity Commercial Bank Limited
20. Fina Bank
21. First Community Bank
22. Giro Commercial Bank
23. Guaranty Trust Bank Kenya
24. Guardian Bank
25. Gulf African Bank
26. Habib Bank
27. Habib Bank AG Zurich
28. Housing Finance Company of Kenya

29. I&M Bank

30. Imperial Bank Kenya

31. Jamii Bora Bank

32. Kenya Commercial Bank

33. K-Rep Bank

34. Middle East Bank Kenya

35. National Bank of Kenya

36. NIC Bank

37. Oriental Commercial Bank

38. Paramount Universal Bank

39. Prime Bank (Kenya)

40. Standard Chartered Kenya

41. Trans National Bank Kenya

42. United Bank for Africa

43. Victoria Commercial Bank

Source: Central Bank of Kenya (2014)

Appendix II: Raw Data

No of Customers reg. Mobile banking

No of Customers reg. Mobile banking	2010	2011	2012	2013	2014
Kenya Commercial (KCB)	12349	13601	52120	65794	75768.1
Equity Bank Limited	45320	49320	53461	57508	65968.9
Co-op Bank	96152	114124	123692	138863	157695
Barclays Bank	35253	42063	46120	52012	57284.5
Standard Chartered Bank Ltd	10941	12126	15618	17572	20630.1
CFC Stanbic Bank	70693	97540	123086	149499	168193
Commercial Bank of Africa	4230	4650	5940	6650	7414.2
Diamond Trust Bank Kenya	628	8260	1290	4055	5241.4
I & M Bank	8275	10843	101162	132980	156497
Citibank, N.A.	10811	10112	15243	16487	18010
NIC Bank Ltd	7293	7342	8461	8867	9566.8
National Bank(NBK)	3398	301	3562	2584	2668.6
Bank of Africa	11905	15398	17531	20571	23366.6
Bank of Baroda (K) Ltd	3012	3201	3561	3807	3982.7

Chase Bank Limited	7351	9834	10157	11920	13045.8
Prime Bank Limited	3064	3203	3561	3773	3959.1
Housing finance	10967	15693	20130	24760	27966.9
Ecobank Kenya Ltd	6532	8651	9821	11624	13191.5
Family Bank	11031	13202	14201	15981	17534.2
Imperial Bank Limited	15051	15234	16137	16560	17163
Bank of India	1153	1259	1615	1804	1957.2
Consolidated Bank of Kenya	5912	6521	6931	7474	8266.5
Fina Bank Limited	4132	4539	4793	5149	5539.9
Equitorial Commercial Bank	1269	1436	1527	1669	1790.6
Gulf African Bank	3254	3516	4216	4624	4941.8
African Banking Corporation	7236	7538	7936	8270	8843.2
Giro Commercial Bank	12318	13209	14281	15232	16058.1
Development Bank of Kenya	5716	6183	6293	6641	7092.7
Fidelity Commercial Bank	1523	1817	3256	3932	4523.1
K-Rep Bank Ltd	1965	2712	2864	3413	3819.1

Guardian Bank	3856	4321	4523	4900	5279.3
First community Bank	1191	2014	2135	2724	3144.8
Habib AG Zurich	1530	1538	2145	2353	2615.9
Victoria Comm. Bank Ltd	1861	1986	2937	3337	3654
Transnational Bank Limited	12262	14723	20352	23869	26991.6
Habib Bank Limited	6360	8097	12711	15407	18302.1
Credit Bank Ltd	7441	9422	14631	17688	20941
Oriental Comm. Bank	8522	10747	16551	19969	23579.9
Paramount-Universal Bank	9604	12073	18471	22250	26218.9
Middle East Bank of Kenya	10685	13398	20391	24531	28857.8
UBA BANK	11766	14723	22311	26812	31496.3
Dubai Bank Limited	12848	16049	24231	29093	34135.3
Jamii Bora Bank	13929	17374	26152	31374	36774.7

Annual amount moved through mobile banking

	2010	2011	2012	2013	2014
Kenya Commercial (KCB)	3,653,681, 000	3,982,191, 000	4,457,989, 000	4,457,989, 000	18,815,320 ,000
Equity Bank Limited	9,288,169, 000	10,920,250 ,000	16,360,520 ,000	16,360,520 ,000	19,299,421 ,000
Co-op Bank	23,180,893 ,000	25,677,208 ,000	34,710,872 ,000	34,710,872 ,000	44,652,812 ,000
Barclays Bank	9,574,081, 000	11,075,841 ,000	12,726,333 ,000	12,726,333 ,000	16,649,320 ,000
Standard Chartered Bank Ltd	1,514,756, 000	2,317,259, 000	3,949,701, 000	3,949,701, 000	5,638,098, 000
CFC Stanbic Bank	20,883,489 ,000	22,912,670 ,000	25,520,173 ,000	25,520,173 ,000	44,434,046 ,000
Commercial Bank of Africa	564,604,00 0	1,247,977, 000	1,527,030, 000	1,527,030, 000	2,144,340, 000
Diamond Trust Bank Kenya	201,077,00 0	213,712,00 0	226,708,00 0	226,708,00 0	465,690,00 0
I & M Bank	1,306,820,	1,632,803,	2,987,275,	2,987,275,	36,519,482

	000	000	000	000	,000
Citibank, N.A.	2,649,740,000	3,377,516,000	3,902,771,000	3,902,771,000	5,502,723,000
NIC Bank Ltd	1,869,619,000	2,253,001,000	2,632,773,000	2,632,773,000	3,054,421,000
National Bank(NBK)	769,652,000	812,250,000	1,226,678,000	1,226,678,000	1,285,882,000
Bank of Africa	2,584,399,000	3,379,682,000	4,297,705,000	4,297,705,000	6,328,691,000
Bank of Baroda (K) Ltd	1,021,991,000	1,067,116,000	1,087,332,000	1,087,332,000	1,285,521,000
Chase Bank Limited	2,455,522,000	2,527,361,000	2,653,711,000	2,653,711,000	3,666,677,000
Prime Bank Limited	971,451,000	1,059,535,000	1,106,104,000	1,106,104,000	1,285,521,000
Housing finance	2,618,694,000	3,563,070,000	3,959,087,000	3,959,087,000	7,266,930,000
Ecobank Kenya Ltd	1,705,003,000	1,890,918,000	2,358,052,000	2,358,052,000	3,545,381,000

Family Bank	2,972,835,000	3,509,281,000	3,982,191,000	3,982,191,000	5,126,561,000
Imperial Bank Limited	5,026,925,000	5,139,918,000	5,433,411,000	5,433,411,000	5,825,457,000
Bank of India	358,473,000	388,075,000	416,233,000	416,233,000	583,015,000
Consolidated Bank of Kenya	1,708,252,000	1,706,808,000	2,134,232,000	2,134,232,000	2,502,091,000
Fina Bank Limited	1,175,416,000	1,327,036,000	1,491,652,000	1,491,652,000	1,730,273,000
Equitorial Commercial Bank	357,029,000	422,731,000	458,109,000	458,109,000	551,247,000
Gulf African Bank	906,832,000	1,121,988,000	1,174,694,000	1,174,694,000	1,521,976,000
African Banking Corporation	2,205,349,000	2,278,632,000	2,612,196,000	2,612,196,000	2,864,896,000
Giro Commercial Bank	3,705,665,000	4,221,895,000	4,446,798,000	4,446,798,000	5,155,441,000
Development Bank	1,791,282,	1,833,519,	2,063,476,	2,063,476,	2,271,773,

of Kenya	000	000	000	000	000
Fidelity Commercial Bank	338,618,000	416,594,000	549,803,000	549,803,000	1,175,416,000
K-Rep Bank Ltd	553,052,000	622,003,000	709,365,000	709,365,000	1,033,904,000
Guardian Bank	1,106,465,000	1,246,172,000	1,392,016,000	1,392,016,000	1,632,803,000
First community Bank	344,394,000	348,004,000	429,951,000	429,951,000	770,735,000
Habib AG Zurich	407,208,000	445,474,000	552,330,000	552,330,000	774,345,000
Victoria Comm. Bank Ltd	551,247,000	627,418,000	671,821,000	671,821,000	1,060,257,000
Transnational Bank Limited	3,491,592,000	1,711,501,000	2,885,112,000	2,885,112,000	17,577,090,000
Habib Bank Limited	7,845,252,000	1,861,316,000	4,684,336,000	4,684,336,000	381,216,000
Credit Bank Ltd	14,895,582,000	671,821,000	325,622,000	325,622,000	145,122,000

Oriental Comm. Bank	7,621,432,000	1,469,631,000	1,439,307,000	1,439,307,000	343,672,000
Paramount-Universal Bank	1,429,921,000	755,934,000	1,068,560,000	1,068,560,000	1,368,190,000
Middle East Bank of Kenya	18,396,560,000	1,943,263,000	266,418,000	266,418,000	46,208,000
UBA BANK	457,748,000	887,338,000	766,042,000	766,042,000	437,532,000
Dubai Bank Limited	188,081,000	2,357,330,000	1,923,769,000	1,923,769,000	906,832,000
Jamii Bora Bank	543,666,000	1,303,932,000	3,561,265,000	3,561,265,000	671,821,000

Total Assets

Tier 1 >Ksh 150B	2010	2011	2012	2013	2014
Kenya Commercial Bank	251,356	282,494	305,161	323,312	364,589
Equity Bank	143,018	176,911	215,829	238,194	279,226
Co-operative Bank of Kenya	154,340	167,772	199,663	228,874	256,780
Standard Chartered Bank	142,746	164,182	195,493	220,524	243,216
CFC Stanbic Bank	107,139	140,087	133,378	170,726	181,638
Barclays Bank of Kenya	172,415	167,305	185,102	207,010	208,428
Tier II Ksh 50><Ksh 150B					
NIC Bank	59,014	73,581	101,772	112,917	131,011
Commercial Bank of Africa	75,459	83,283	100,456	124,882	132,969
Diamond Trust	83,600	77,448	94,512	114,136	119,023
I&M Bank	62,552	76,903	91,520	110,316	125,534
Citibank	62,070	74,646	69,580	71,243	79,957
Chase Bank	21,859	36,513	49,105	76,569	85,737
Bank of Africa	26,699	38,734	48,958	52,683	64,934
Bank of Baroda	32,332	36,701	46,138	52,022	60,017
National Bank of Kenya	60,027	68,665	67,155	92,493	94,740
Tier III Ksh 15B><Ksh 50B					
Prime Bank	32,444	35,185	43,463	49,461	55,613
Housing Finance	29,326	31,972	40,686	46,755	53,913
Imperial Bank	19,719	25,618	34,590	43,006	48,708

Ecobank	26,892	27,210	31,771	36,907	42,584
Family Bank	20,188	26,002	30,985	43,501	48,152
Bank of India	19,671	23,352	24,877	30,721	33,561
ABC Bank	10,349	12,507	19,071	19,640	23,125
Consolidated Bank	10,479	15,318	18,001	16,779	21,680
Equatorial Commercial Bank	10,399	12,927	14,109	15,562	19,265
Gulf African Bank	9,594	12,915	13,562	16,054	18,148
Development Bank of Kenya	10,645	11,523	13,417	15,581	17,169
GT Bank Kenya	20,944	14,630	17,150	25,638	22,585
Tier IV <Ksh 15B					
Giro Commercial Bank	10,234	11,846	12,280	13,623	15,619
Fidelity Commercial Bank	8,209	10,789	11,772	12,779	15,247
Guardian Bank	8,031	8,836	11,745	12,835	14,393
Victoria Commercial Bank	6,215	7,645	10,323	13,644	14,932
First Community Bank	6,380	8,740	9,959	11,305	13,353
Habib A.G. Zurich	8,127	8,722	9,702	11,009	11,655
K-Rep Bank	7,670	9,319	9,546	13,199	13,574
Trans-National Bank	4,762	7,287	8,801	9,658	11,762
Paramount Universal Bank	4,420	4,727	7,255	8,029	9,314
Habib Bank Ltd	5,426	5,861	7,014	8,078	8,736
Credit Bank	4,530	5,394	6,407	7,309	8,211
Oriental Commercial Bank	4,558	5,030	6,220	7,007	8,044
Middle East Bank	4,018	4,639	5,870	5,766	6,817

Jamii Bora Bank	1,726	2,070	3,480	7,010	7,393
UBA Kenya Ltd	3,028	3,206	2,924	3,710	4,282
Dubai Bank	1,874	2,316	2,584	2,927	3,271

Return on Assets

ROA	2010	2011	2012	2013	2014
Kenya Commercial (KCB)	0.0517	0.0498	0.052	0.0591	0.06379
Equity Bank Limited	0.0695	0.0684	0.074	0.0799	0.08501
Co-op Bank	0.0624	0.0718	0.07	0.0794	0.08544
Barclays Bank	0.0361	0.0368	0.048	0.0501	0.05479
Standard Chartered Bank Ltd	0.0537	0.0503	0.059	0.0572	0.05839
CFC Stanbic Bank	0.0196	0.0223	0.035	0.0394	0.04612
Commercial Bank of Africa	0.0464	0.0643	0.104	0.1066	0.12182
Diamond Trust Bank Kenya	0.049	0.0419	0.049	0.0528	0.05646
I & M Bank	0.0441	0.0457	0.042	0.0484	0.05125
Citibank, N.A.	0.0449	0.0356	0.017	0.0142	0.00597
NIC Bank Ltd	0.0565	0.0457	0.036	0.0427	0.04269
National Bank(NBK)	0.0237	0.0307	0.027	0.0307	0.03251
Bank of Africa	0.0245	0.0233	0.027	0.0266	0.02731
Bank of Baroda (K) Ltd	0.0643	0.0637	0.055	0.0614	0.06257
Chase Bank Limited	0.0504	0.0418	0.024	0.0254	0.02

Prime Bank Limited	0.0107	0.0212	0.02	0.0297	0.03621
Housing finance	0.0246	0.0161	0.01	0.0104	0.00792
Ecobank Kenya Ltd	0.0467	0.0412	0.029	0.0355	0.03519
Family Bank	0.0049	0.012	0.028	0.0445	0.05991
Imperial Bank Limited	0.062	0.0279	0.017	0.0178	0.0116
Bank of India	-0.0032	0.0055	-0.046	-0.0517	-0.0697
Consolidated Bank of Kenya	0.0459	0.0279	0.009	0.0183	0.01637
Fina Bank Limited	0.0144	0.0275	0.032	0.0646	0.08678
Equitorial Commercial Bank	0.0222	0.0137	0.008	0.0035	-0.0018
Gulf African Bank	0.0333	0.0405	0.037	0.0455	0.05023
African Banking Corporation	0.0305	0.0291	0.042	0.0373	0.03821
Giro Commercial Bank	0.0139	0.0192	0.019	0.0245	0.02823
Development Bank of Kenya	0.05	0.0431	0.048	0.0485	0.04954
Fidelity Commercial Bank	0.0434	0.0462	0.065	0.0673	0.0746
K-Rep Bank Ltd	0.0401	0.0383	0.018	0.0323	0.03461
Guardian Bank	0.0074	0.0095	0.013	0.007	0.00466
First community Bank	0.0635	0.0239	0.012	0.0178	0.01375

Habib AG Zurich	0.0511	0.0199	0.008	0.0111	0.00627
Victoria Comm. Bank Ltd	0.0018	0.009	-0.012	-0.0096	-0.0137
Transnational Bank Limited	0.025	0.0163	0.0056	0.01	0.00852
Habib Bank Limited	0.0243	0.0153	0.0041	0.0085	0.00684
Credit Bank Ltd	0.0236	0.0143	0.0026	0.007	0.00516
Oriental Comm. Bank	0.0229	0.0132	0.0012	0.0055	0.00351
Paramount-Universal Bank	0.0222	0.0122	-0.0003	0.004	0.00183
Middle East Bank of Kenya	0.0215	0.0112	-0.0018	0.0025	0.00019
UBA BANK	0.0208	0.0102	-0.0033	0.001	-0.0015
Dubai Bank Limited	0.0202	0.0091	-0.0048	-0.0005	-0.0032