THE EFFECT OF INFORMATION AND COMMUNICATION TECHNOLOGY INVESTMENT ON FINANCIAL PERFORMANCE OF MICROFINANCE BANKS IN KENYA

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DECLARATION

This research project is my original work and has not been presented to any other institution of higher learning for an award of Diploma or a degree.

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

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DEDICATION

This research project is dedicated to my Lord, Jesus Christ for His grace and sufficient provision throughout the entire programme. To my family and friends and a special feeling of gratitude to my loving parents, whose words of encouragement and push for tenacity ring in my ears, and to my sisters and brothers who have never left my side. I also dedicate my project to my supervisor, Dr Cyrus Iraya for helping me develop research skills. Thank you all for being the best cheer leaders.

ABSTRACT

The study sought to determine the effect of ICT investment on financial performance of microfinance banks in Kenya. The study did a descriptive survey of nine (9) microfinance banks that had been in operation for five years (2010-2014). The study used secondary sources of data that was obtained from central bank of Kenya audited reports of the nine microfinance banks. Data analysis involved descriptive statistics, correlation analysis and regression analysis. The study concluded that the microfinance banks should continue investing in modern technologies like ATMs and issuance of debit and credit cards. This is because these kinds of technologies play an integral role of increasing access to financial services to customers in an efficient and effective manner. This brings about increased cost reduction and thus improves financial performance. The regression results found that logarithm of assets and operating efficiency variables are statistically significant in the model. On the other hand, debits and credit cards were found to be statistically insignificant because their probability (p)-values were above 5%. The limitation of this study is that it limited itself to microfinance banks that were in operation between 2010-2014. The study proposes that it would be imperative to consider carrying out a more comprehensive examination on the relationship between ICT investment and financial performance in the entire banking industry to find out whether these facts will still hold. The study also recommends that MFBs should adapt growth strategies that will help to win the clients trust thus enjoying the benefits of large scale by creating a platform for building branch networks and ATMs as a way of reaching out to many customers across the country.

TABLE OF CONTENTS

LIST OF TABLES

ABBREVIATION AND ACRONYMS

ATM Automated Teller Machine

CBK Central Bank of Kenya

ICT Information Communication Technology

RTGS Real Time Gross Settlement Systems

MFBs Microfinance Banks

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The ICT investment is basically a learning process in which decision makers create and distribute knowledge at organizational and individual levels. At organizational levels, the suppliers, the workers and outside experts participate in decision making. In most firms, this process is often concentrated to the entrepreneur or manager. The human element is inevitable and critical for effective decision making. The knowledge management systems are also presented as tools to improve decision making and knowledge use in organization.

There is no doubt that executives play a crucial role in the process of implementing ICT investments (Kohli and Devaraj, 2004). At the same time, ICT executives' perceptions were also shown to be an excellent proxy measure for successful ICT implementation and were also found to be highly correlated with banks performance. In a study by Venkatraman and Ramanujam (1987), senior executives were asked to rate their firm's financial performance relative to that of their biggest competitors using a number of different performance criteria, including sales growth, net income growth and ROI. The resulting high degree of correlation between the perceptual and objective performance measures led the authors to conclude that perceptual data from senior managers can be employed as acceptable operationalization of business economic performance (Stiroh, 2001). Investment in ICT has brought a complete paradigm shift on the banks performance and on the customer service delivery in the banking industry (Ongori and Migiro, 2010).

The use of ICT concepts, techniques, polices and an implementation strategy to banking services has become important in serving the growing needs of customers. Adeoti (2011) notes that ICT investment directly affects how managers decide, how they plan and what products and services are offered in the banking industry. It has continued to change the ways banks and their corporate relationships are organized globally and a variety of innovative tools available to boost speed and quality of their service delivery (Brynjolfsson and Hitt, 1996).

1.1.1 ICT Investment

Spanos et al. (2001) ICT investment covers the acquisition of equipment and computer software that is used in production for more than one year. ICT has three components: information technology equipment (computers and related hardware), communications equipment, and software. Software includes acquisition of pre-packaged software, customized software and software developed in-house.

Data availability and measurement of ICT investment vary considerably across countries; this may affect the comparability of ICT investment across countries depending on how they differentiate between intermediate consumption and investment in practice (Ashrafi and Murtaza, 2008). Investments in ICT in the financial sector enable increased efficiency and accessibility to information this improves coordination of activities within the organizational boundaries. Examples of ICT investments in the banking sector include: internet banking, use of automated teller machines (ATMS), internet banking and mobile banking (Polasik and Wisniewski, 2009).

ICT investment in the banking sector is measured according to the ICT product. ATM is one of the ICT product in the banking sector that is allows the customers to deposit cash and make withdrawals outside the banking hall (Wisniewski, 2008). ATM transactions are measured using the number of transactions per day divided by the total number of transactions per year.

1.1.2 Financial Performance

According to Hicks and Niehans (1998) financial performance can be defined as the accomplishment of a given task that is measured using predetermined standards of accuracy, completeness, efficiency and effectiveness. Financial performance measures are used to evaluate how well a company is using its resources to make profits. Examples of financial performance include operating income, earnings before interest and taxes, and net asset value. It is worth mentioning that no one measure of financial performance should be taken on its own. Rather, a thorough assessment of a firm's performance should take into consideration more than one measure of financial performance.

The measures of financial performance are, return on equity (ROE) and return on assets (ROA). Return on equity measures the efficiency of a firm at generating profits from each unit of shareholder equity, also known as net assets or assets minus liabilities. Return on assets expresses the net income earned by a company as a percentage of the total assets available for use by that company. With return on Assets companies with higher amounts of assets should be able to earn higher levels of income and profitability. Return on Assets measures management's ability to earn a return on the firm's resource (Liang and Lu, 2010).

1.1.3 ICT Investment and Financial Performance

The benefits of investing in ICT in the enhancement of banking service is not only limited to cost reduction benefits but also found to have significant contribution to giving access to customers residing outside the branch network and create opportunities for effective cross-selling. For instance use of debit cards allows customer to transact with other banks through the ATM. This improves efficiency and increases sales and hence financial performance (Gerrard and Cunningham, 2003).

Sathye (1999) argues that ICT investments bring real benefits to the banks. ICT adoption in the banking sector for example, internet banking allows customers to access financial services conveniently, this reduces cost of transaction and improves efficiency. This in turn leads to a positive impact on financial performance. Agboola (2001) studied the impact of computer automation on the banking services in Lagos and discovered that electronic banking has tremendously improved the services of some banks to their customers in Lagos. He made a comparative analysis between the old and new generation banks and discovered variation in the rate of adoption of the automated devices between automated banks and those that failed to automate their services.

Investment in ICT allows customers to access their bank accounts to make cash withdrawals, credit card cash advances, and check their account balances as well as purchase prepaid cellphone credit. This improves convenience since customers can withdrawal money from their point of reach without necessarily visiting the bank. This increases efficiency and mitigates the costs of transactions leading to financial performance. This is in line with a study conducted by Shawkey (1995) who investigated

the contribution of automated teller machines on bank's financial performance. The results revealed that investment in ATMs led to an increase in both volume and value of deposit accounts, this led to reduced banking transaction costs, reduced number of staff and the number of branches and consequently bank's profitability.

1.1.4 Microfinance Banks in Kenya

The Microfinance Act, 2006 and the Microfinance (Deposit Taking Institutions) Regulations 2008 issued thereunder sets out the legal, regulatory and supervisory framework for the microfinance industry in Kenya. The Microfinance Act became operational with effect from 2nd May 2008. Deposit Taking Microfinance Limited institutions in Kenya provide financial services to Micro, Small and Medium Businesses sector and individuals who earn low incomes. CBK (2015) indicate that there are 11 eleven microfinance banks that are licensed to work and operate in Kenya (See Appendix I).

The rapid investment in ICT has made some of the functions of the banks more efficient and cheaper; this has increased deposits, sales and performance of these firms. Most microfinance banks in the developing countries are adopting internet banking, customers can now transfer money, access their accounts, online shopping, get bank statement, pay bills, and conduct other transactions that took a long time of process in the past. Adoption of ICT has brought changes that are attributable to saving costs, efficiency and convenience to customers (Musyoka, 2014).

To boost their profitability, microfinance banks are investing in ICT to mitigate costs and increase efficiency to achieve customer satisfaction. These firms have embarked on

deployment of ICT based banking products and services such as automated teller machine (ATM), internet banking, mobile banking solutions, point of sale terminals, computerized financial accounting and reporting, human resources solution (Juma, 2012).

1.2 Research Problem

Competition has forced firms to invest in ICT to realize increased efficiency and quality service delivery. The advantage of investing ICT in firms is not only limited to cost reduction but also innovation. Investment in modern technologies for example ICT enhances convenience by extending access to customers residing outside the branch network and creating opportunities for effective cross-selling. This in turn increases sales and profitability of the firm (San-Jose, Ituralde & Maseda, 2009).

In Kenya, the changing nature of the business environment has forced most commercial banks to investment in ICT to match the growing need of their customers. The banking environment presents challenges that force banks to invest in ICT to become more competitive. Juma (2012) indicates that microfinance banks operate in a complex and competitive environment characterized by changing conditions and highly unpredictable economic climate with information communication technology being at the center of this global change curve.

A sizeable number of studies on relationship between ICT investment and financial performance have been undertaken for example, Bitler (2001) investigated the effect of ICT investments on performance of SME's. The study revealed that SME's using ICT performed better compared to those that were reluctant to adopt ICT. In their study conducted to examine technological progress and its effects in the banking industry,

Berger et al. (2003) found that ICT investment led to reduction in costs and improved performance. Osei and Harvey (2011) studied investments in ICT and business performance in Ghana. The results revealed that there was a positive correlation between investment in ICT and profitability for high ICT level manufacturing firms than for lower ICT level firms.

Muyoka (2014) examined the relationship between mobile banking on the financial performance of commercial banks in Kenya. It was found that there existed a statistically significant relationship between mobile banking and profitability of commercial banks in Kenya. Juma (2012) studied the relationship between the impacts of ICT adoption on growth of commercial banks in Kenya. The study concluded that there was a positive correlation between ICT and growth of commercial banks. Kimani (2014) carried out a study on the effect of ICT adoption on the financial performance of savings and credit co-operative societies in Nairobi County. The results revealed that ICT adoption led to improved financial performance.

From the above studies, little attention has been laid on ICT investment and financial performance within the context of microfinance banks. This study therefore seeks to bridge this gap by finding an answer to the research question, what is the effect of ICT investment on financial performance of microfinance banks in Kenya?

1.3 Research Objective

To determine the effect of ICT investment on financial performance of microfinance banks in Kenya.

1.4 Value of the Study

This study will inform the benefits of adopting ICT as a tool to enhance efficiency and cost reduction. Central bank and other policy makers might use the findings of this study to set policies that promote adoption of ICT by commercial banks and boost performance. This study will be useful to commercial banks, they will learn the benefits of investment in ICT and how this impacts on financial performance. They will also know the challenges faced by other commercial banks in implementing ICT and how to deal with these challenges. This will encourage commercial banks and microfinance institutions that are still reluctant in embracing ICT to implement it and reap the benefits.

This study will add to the existing body of knowledge in terms of theory, application and relevance. Students will be able to learn how the theories relate to empirical studies and how it contributes to knowledge. Researchers interested in this area of study or related disciplines might use these findings as a point of reference for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the theoretical review, determinants of financial performance, empirical review and summary of the literature review.

2.2 Theoretical Review

This section discusses the theories that support the relationship between ICT investment and financial performance. These theories are technology acceptance model, diffusion of innovation theory and resource based theory.

2.2.1 Technology Acceptance Model

Technology acceptance model (TAM) was originally proposed by Davies in 1986. This model was designed to forecast the user's acceptance of information technology and usage in an organizational setting. Cracknell (2004) posits that firms are adopting technology to cope with the dynamics of the external environment. This model has been tailored in a manner that can accommodate changes for improved costs reduction and efficiency. Technology Acceptance Model deals with perceptions as opposed to real usage, the model suggest that users , the key factors that influence their decision on how, where and when they will use it (Davis, 1989).

The factors to consider are: Perceived usefulness (PU). According to Davis, it is the degree to which a person believes that using a particular system will lead to improved

performance. Perceived ease-of-use (PEoU) is explained as the degree to which a person believes that using a particular system would results to improved productivity.

The TAM was proposed by Davis et al. (1989), this model expounds on the attitude behind the objective to use technology or a services. This theory is relevant to this study since it explains user‘s acceptance of information technology and usage in an organizational context. Acceptance is the first process in technology use and has a bipolar implication. Acceptance firstly, is a precursor to adoption and hence this theory complements the preceding theories. Secondly, acceptance dictates the attitude and perception of the users which eventually affects efficiency of use and hence performance.

The supporters of this theory; Britton and McGonegal (2007), argue that strategic adoption as well as operational efficiency and hence productivity of systems are a function of acceptance of the technology. It is thus plausible to conclude that without acceptance, the rest of the theories would be redundant and invalid. Though acceptance is an initial phase, it is also an attitude shaping facet that influences adoption and effectiveness of use.

2.2.2 Diffusion of Innovation Theory

Rogers (1962) posits that diffusion of innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures. Rogers (1962) explains that critical factors that determine the adoption of an innovation at the general level are the following: relative advantage, compatibility, complexity, trialability and observability.

Relative advantage refers to the degree to which an innovation is perceived as providing more benefits than its predecessor. It results in increased efficiency, economic benefits and enhanced status. Previous research has concluded that relative advantage of an innovation is positively related to the rate of adoption. When a user perceives relative advantage or usefulness of a new technology over an old one, they tend to adopt it. In the context of ICT adoption, benefits such as immediacy, convenience and affordability to customers have been reported. Thus, it is assumed that, when customers perceive distinct advantages offered by ICT, they are more likely to adopt it (Roberts and Amit, 2003).

Compatibility refers to the degree to which a service is perceived as consistent with users' existing values, beliefs, habits and present and previous experiences (Chen et al., 2004). Compatibility is an important feature of innovation as conformance with user's lifestyle can propel a rapid rate of adoption (Rogers, 2003).

Observability of an innovation describes the extent to which an innovation is visible to the members of a social system, and the benefits can be easily observed and communicated (Rogers, 2003). Moore and Benbasat (1991) simplified the original construct by redefining observability into two constructs: visibility and result demonstrability. According to Ram and Sheth (1989) trialability is defined as the capacity to experiment with new technology before adoption. Potential adopters who are allowed to experiment with an innovation will feel more comfortable with it and are more likely to adopt it. Perceived risk refers to the degree of risks in using an innovation.

2.2.3 Resource Based Theory

Barney (1991) posits that the possession of strategic resources provides an organization with a golden opportunity to develop competitive advantages over its rivals. These competitive advantages in turn can help the organization enjoy strong profits. In reference to Wernerfelt (1984) a strategic resource is an asset that is valuable, rare, difficult to imitate, and no substitutable. A resource is valuable to the extent that it helps a firm create strategies that capitalize on opportunities and ward off threats.

Prehalad and Gary (1990) posit that firms align their resources, skills and expertise into core competence to gain a competitive edge against their competitors. Core competencies in this case are the activities that an organization does better than its competitors (Chi, 1994). A strategy acts as an integral part of the organization's goals and objectives in a firm, strategy acts as a plan of action that links together an organization's key goals, policies and action sequences towards achieving the vision and the vision. A strategy that is well aligned to the organization's goals and objectives play an essential role of assembling and allocation of an organization's resources into a viable setting based on the organizational capabilities, external environment and contingent moves by their competitors. Mintzberg (1994) defines a strategy as a plan of actions that is designed to achieve certain goals and objectives.

The supporters of this theory: Stern & Stalk (2001) argue that the firm is assumed to consist of internal and external coalition which emanate from the social exchanges that are formed to enhance and control behavior. The external environment is assumed to

consist of scarce and valued resources that are key for organizational survival. This is because of the uncertainty involved in the external environment in resource acquisition.

The relevance of this theory is that the banking environment is dynamic, it is characterized by risks and uncertainties due to changes in the external environment. This necessitates the need for adopting strategies to counter challenges in the external environment. According to Ortega (2010), organizations aim to achieve two key objectives namely: control over resources in order to reduce dependence on other firms and gain control over resources that enhance dependence of other firms on themselves.

2.3 Determinants of Financial Performance

The determinants of microfinance banks financial performances can be categorized into specific (internal) and macroeconomic (external) factors. According to Al-Tamimi (2010) and Aburime (2005) these are stochastic variables that define the output. Internal factors are individual bank characteristics which affect performance. These factors are primarily influenced by internal decisions of the firm's management. The external factors are country-wide factors which that are beyond the firm's control with a high impact of the bank's profitability.

2.3.1 Capital Adequacy

Capital is one of the internal factors that affect the financial performance of the bank. Capital is own fund that is readily available to support the bank's business and act as a buffer in adverse situations (Athanasoglou et al. 2005). The capital of the bank enables liquidity for the bank due to the fact that deposits are sensitive and prone to bank runs. More capital resources of the bank reduce the chance of distress (Azam and Siddiqoui,

2012). Capital adequacy is the amount of capital needed by the bank to enable it to withstand financial risks such as credit, market and operational risks that they are exposed to in order to absorb potential losses and prevent the bank debtors.

According to Dang (2011), the adequacy of capital is determined on the basis of capital adequacy ratio (CAR). Capital adequacy ratio signifies the internal strength of the financial institution to withstand losses during crisis. Capital adequacy ratio directly impacts on the financial performance of the bank. This is achieved through determining the expansion of its risky but profitable investment areas (Sangmi and Nazir, 2010).

2.3.2 Asset Quality

The other determinant of financial performance in a microfinance bank setting is Asset quality. The bank asset includes: current asset, credit portfolio, fixed asset, and other investments. The growth of the bank is related to its age (Athanasoglou et al., 2005). The loan of the bank is a key asset that generates most of the bank's income. Loan is a key asset of commercial banks from which they generate income. The quality of loans portfolio determines the financial performance of the bank.

The highest risk facing banks is the losses derived from loans (Dang, 2011). Different types of financial ratios are used to determine the performance of banks by various scholars. It is a major concern for all commercial banks to maintain minimum levels of nonperforming loans. This is because high levels of nonperforming loans have a negative impact on the financial performance of the banks. Low level of nonperforming loans is a strong indicator of a sound financial health of a bank's portfolio. Sangmi and Nazir (2010) emphasize that the lower the ratio the better the bank performs.

2.3.3 Management Efficiency

Management Efficiency is one of the main internal factors that determine the bank profitability. It is denoted by different financial ratios like total asset growth, loan growth rate and earnings growth rate. Dang (2011) indicates that operational efficiency in managing the operating expenses is another dimension for management quality. The performance of the firm is often expressed qualitatively through subjective evaluation of management systems, organizational discipline, control systems, quality of the staff, and others.

The ability of the firm to allocate resources efficiently, income maximization and reduction of operational costs can be measured using financial ratios. The ratio used to measure management efficiency is operating profit to income ratio (Sangmi and Nazir, 2010). The higher the operating profits to total income (revenue) the more efficient the management in terms of operational efficiency and income generation. The ratio of operating expenses to total asset is expected to be negatively associated with profitability. Management quality determines the level of operating expenses and in turn affects profitability (Athanasoglou et al. 2005).

2.3.4 Liquidity Management

Liquidity is another factor that determines the level of bank performance. Liquidity is the ability of the bank to fulfill its obligations, mainly of depositors. According to Dang (2011) adequate level of liquidity is positively related to bank profitability. The most common financial ratios that reflect the liquidity position of the bank is customer deposit to total asset and total loan to customer deposits. Other scholars have used different

financial ratios to measure the liquidity position of the bank for instance Ilhomovich (2009) applied cash to deposit ratio to measure the liquidity level of banks in Malaysia. However, the study conducted in China and Malaysia found that liquidity level of banks has no relationship with the performances of banks (Said and Tumin, 2011).

2.3.5 External or Macroeconomic Factors

There many macroeconomic variables that affect the financial position of banks. This study will look at gross domestic product (GDP) and political instability as follows: Political instability is a macroeconomic variable that affect the performances of banks. For instance, the pattern of GDP affects the demand for the bank's asset. During the declining GDP growth the demand for credit falls which in turn negatively affect the profitability of banks. On the contrary, in a growing economy as expressed by positive GDP growth, the demand for credit is high due to the nature of business cycle. During boom the demand for credit is high compared to recession (Athanasoglou et al., 2005).

According to Azam and Siddiqoui (2012) information communication technology is a macroeconomic variable that affects financial performance. Use of information communication technology has enhanced information sharing in the bank and hence improved speed of operations. Through integrated systems, commercial banks are able to integrate their suppliers and other stakeholders in decisions. These have assisted banks in reducing communication costs and hence boost financial performance (Ray and MacMillan, 2005).

Sangmi and Tabassum (2010) argue that firms that invest in ICT are able cut costs of operations, improve on their efficiency and thus achieve profitability. ICT tools and

innovations for example; use of ATM's, debit and credit cards and internet banking has improved financial deepening through opening up additional channels whereby customers can interact with their bank accounts without necessarily visiting the banks. With internet banking, account holders can transact using electronic fund transfer (EFT). This is more convenient and costs effective to the customers. Through the use of automated teller machines, account holders can use their debit cards to withdraw money from other banks. This has significantly reduced costs, enhanced convenience and thus increasing sales and profitability among banks (Ray and MacMillan, 2005).

2.4 Empirical Review

Bidley (2000) investigated the impact of ICT investment on financial performance of manufacturing firms. The study used a descriptive study. The study used a descriptive survey to establish whether the variables correlate. Secondary data sources were used for five years from the financial statements of manufacturing firms. A regression model was used to show the relationship between the variables. The study found that there exist a positive relationship between manufacturing firms that invested in ICT and financial performance of manufacturing firms.

Agboola (2001) conducted a study on the relationship between ICT investment and performance in Nigeria. A survey of 100 banks was conducted and secondary data sources from financial statements of these firms were used. The researcher did a cross-sectional study for these firms and the data was analyzed using descriptive statistics. It was concluded that there was a positive relationship between ICT investment and profitability of commercial banks in Kenya.

Bitler (2001) studied the effect of investing in ICT on the performance by SME's. The study used a descriptive survey to find out the relationship between the variables. The study used an exploratory survey and panel data for 10 year. Primary data was collected using a semi-structured questionnaire and secondary data was obtained from financial records and statements of small and medium enterprises. The results of the study found that SME's that highly invested in ICT were positively related to financial performance.

Berger and Wharton (2003) evaluated the relationship between the impacts of ICT investment on the financial performance of commercial banks in Netherlands. The study used a descriptive survey and secondary data source for five years was obtained. A regression model was used to show the relationship between the variables. The study concluded that investment in ICT led to reduction of costs and improved efficiency.

Ashrafi and Murtaza (2008) carried out a study on the relationship between ICT adoption and financial performance of SME's in Ghana. The study used a cross-sectional survey design whereby secondary sources of data were obtained from the financial statements of SME's. The study adopted a regression model for analysis; the results revealed that there was a positive correlation between ICT adoption and financial performance of SME's in Ghana.

Mwangi (2012) studied the impact of information communication technology development on financial performance of Commercial Banks in Kenya. The study used a descriptive survey to explain the relationship between ICT developments and financial performance. The research data was collected through use of questionnaires, only primary data was used. The respondents were employees of commercial banks in Kenya.

Data was collected from all the 44 commercial banks in Kenya. The result indicates that ICT led to improved service quality and customer satisfaction.

Juma (2012) studied the impact of ICT adoption on financial performance of commercial banks in Kenya. The study used a descriptive survey. Data was collected with the help of a semi-structured questionnaire. Analysis was done using a regression model and the results of the analysis found that ICT improved the operations, the liquidity and the asset quality of commercial banks in Kenya.

Kimata (2013) did a study on effects of ICT on the financial performance of deposit taking SACCOS in Nairobi County. The study used a descriptive survey to find out how ICT impacts on customer services system and reduction in operational costs. The population of interest was all the 44 deposit taking Sacco's in Nairobi County. Secondary data was sourced from the Sacco's annual financial reports and Sacco Societies Regulatory Authority (SASRA) supervisory reports. The data covered the period 2008 to 2012. Data analysis involved reducing accumulated data to manageable levels, developing summaries, looking for patterns and applying statistical techniques. The study established that ICT adoption were a major contributor to financial performance of DTS.

Kamau (2014) carried out a study on the effect of ICT adoption on the financial performance of micro-finance institutions in Kenya. The study did a descriptive survey to find out the factors that influence ICT adoption on financial performance of micro finance institutions in Kenya. The study carried out tests on the effects of ICT adoption on the Financial Performance of MFIs for the period 2008-2012. Primary data was collected through a questionnaire. An analytical model was developed to determine the

strength of the relationship between variables. Analysis of the data showed that there was a positive correlation between ICT adoption and financial performance of MFI's.

A study by Keah (2014) investigated the effect of ICT adoption on the financial performance of savings and credit co-operative societies in Nairobi County. Descriptive survey and a cross-sectional research design were used. The population of the study involved 45 deposit and non-deposit taking Sacco's. Purposive sampling technique was used in selecting the 40 SACCOs. Secondary data was used to collect information from financial statements and records. Descriptive and inferential analysis techniques were used involving mean, standard deviation, median, minimum and maximum values. The results indicate that an increase in ICT adoption leads to an increase in Sacco's financial performance.

2.5 Summary of the Literature Review

From the literature review, most studies locally and globally have shown that there exists a positive relationship between ICT investment and financial performance of firms. The local studies known to the researcher that have investigated the relationship between ICT investments; adoption and financial performance and found a positive relationship are as follows: Keah (2014), Kamau (2013), Juma (2012) and Mwangi (2012). On the other hand, global studies are: Murtaza (2008), Berger and Wharton (2003), Agboola (2001) and Osei et al. (2000) among others. However, none of the above studies have investigated the relationship between ICT investment and financial performance in the context of microfinance banks in Kenya. Taking into consideration the current demand to

increase financial deepening among the low income earners, ICT investment plays an integral role for this purpose.

The empirical findings have confirmed that there exists a positive relationship between ICT investment and financial performance. This also supports the assumptions held by the above theories on the importance of ICT in enhancing financial performance. This is however consistent with the hypothesis of this study which predicts a positive relationship between ICT investments and financial performance. The theories of this study; technology acceptance model, diffusion of innovation theory and resource based theory also show that ICT investment positively impact on financial performance of firms. This has been attributed to reduction of costs, enhanced efficiency, increased sales and profitability. Although extensive research has been done on ICT and financial performance; little focus has been placed within the context of microfinance banks in Kenya. Therefore, this necessitates the need to investigate the effect of ICT investments on financial performance of microfinance banks in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was applied in conducting the study. It consists of the research design, population for the study, data collection methods and tools, data analysis and presentation a method that was used.

3.2 Research design

Creswell (2009) defines research design as an outline of how data was collected and analyzed in pursuit of obtaining specific answers to research questions. This study adopted a descriptive research design this is because it highlights a characteristic behavior on one variable because of another variable. A descriptive survey explains the relationship between variables (Kothari, 2005). This kind of design was appropriate in establishing the relationship between ICT Investment and financial performance of microfinance banks in Kenya.

3.3 Population of the Study

The population for this study includes microfinance banks that are licensed to work and operate within the boundaries of Kenya. According to (CBK, 2015) there are eleven (11) microfinance banks (See Appendix I). These banks are licensed and regulated by the central bank of Kenya. The study adopted a census survey since all the eleven microfinance banks was studied. This is because the population under investigation is small and secondary data is accessible from the Association of microfinance banks (AMFI). The study chose microfinance banks because of their current demand to invest

in ICT as a tool to enhance financial deepening to low income earners in an efficient and cost effective manner.

3.4 Data Collection

The study used secondary data since the nature of the data to be collected is quantitative. To achieve the objective of this study, secondary data for a five year period (2010-2014) was obtained from financial statements and records of microfinance banks in line with the variables defined in the regression model as provided below (See 3.6.1 regression model below).

3.5 Data Analysis

Kothari (2005) indicate that data should be cleaned, coded and properly analyzed in order to obtain a tenable report. The data collected was sorted and organized before capturing it in Statistical Packages for Social Sciences (SPSS) for analysis. To get the correct measurements for analysis, financial performance (dependent variable) was measured using ROA. ICT investment was measured using investment in ATMs which was measured using the total number of ATMs, investment in Debit and credit Cards which was measured using the number of Debit and credit Cards issued. The analyzed data was presented in form of tables and charts. Percentages mean and standard deviation was used in determining the relationship between the variables.

3.5.1 Regression Model

The study adopted a regression model to establish the relationship between ICT investment and financial performance of microfinance banks in Kenya. The study seeks to extent the model as earlier advanced by Juma (2012) who investigated the impact of

ICT adoption on financial performance of Commercial banks in Kenya. The regression model to be adopted in this study is as follows:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + + \beta_4 X_4 \ \epsilon}$$

$\beta_0 - \beta_3$, are the regression coefficients

Y is the financial performance which was measured return on assets (ROA) which is net income divided by total assets.

X_1 represents investment in ATMs which was measured using the total number of ATM machines

X_2 is the investment in Debit and credit Cards which was measured using the number of Debit and credit Cards issued.

X_3 is the size of the bank which was measured by log (Total Assets)

X_4 is the operating efficiency ratio which was measured using total operating expenses divided by total income

β_0 = gradient or slope of the regression measuring the unit of change in y associated with a unit change in X

ϵ = Error term within a confidence interval of 5%

3.5.2 Tests of Significance

T-test was used to test the hypothesis of this study that there exists a positive relationship between ICT investments and financial performance of microfinance banks in Kenya. The level of significance was expressed using p-values. If the p-value(s) is more than 5%

then the null hypothesis is true since this meant that there is no statistically significant relationship between ICT investment and financial performance. Similarly, if the p-value is less than 5% then the alternative hypothesis was considered true since this meant that there is a positive relationship between variables. The coefficient of determination was used to determine if the model is a satisfactory predictor or not using the R^2. R is the correlation coefficient which varies from -1 to +1. (-1) means a perfect negative correlation and (+1) means perfect positive correlation. Analysis of variance (ANOVA) was used to determine the impact independent variables have on the dependent variable in a regression analysis. F-test was used to test the significance of the regression model. The appropriateness of the multiple regression models as a whole was tested by this test. A significant F indicates a linear relationship between Y and at least one of the X's. All the tests were performed at 95% degree of confidence.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter consists of the descriptive statistics, Pearson's correlation coefficient and the regression analysis. Data analysis has been done in line with the objective of this study which was to determine the effect of ICT investment on financial performance of microfinance banks in Kenya.

4.2 Descriptive Statistics

Descriptive statistics was done to show a trend on the variables under investigation within the study period. It depicts the minimum values, maximum values, means and standard deviation of ROA, debit and credit cards issued number of ATMs and operating efficiency. Below are the descriptive results shown in the table 4.1 below:

Table 4.1 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	35	-.16	.02	-.0162	.04810
Debit and Credit	36	.00	6370.00	176.9444	1061.66667
ATMs	36	.00	97.00	7.2778	24.64562
Operating Efficiency	35	.00	3.71	1.0008	.72521
LA	36	.00	10.43	7.4915	3.49454
Valid N (listwise)	35				

Source: Research findings

From the above results in table 4.1 above, the findings show that mean percentage of financial performance of microfinance banks is estimated at 1%. Financial performance increased rapidly within the study period (2010-2014). This could have been as a result of adoption of modern technologies for instance debit and credit cards, ATMs. The findings

also found that debit and credit cards issued within the study period increased by 65.8% this is an indication that most microfinance banks are investing modern technologies. The number of ATMs has increased in the study period by an estimated 7%. The level of operating efficiency of microfinance banks was found to be 1.008 which is an indication that most microfinance banks were not able to make maximum use of technology resources to generate adequate revenues. This is because most of their operating ratio was above 50% which is regarded as the maximum optimal ratio. The assets portfolio of microfinance banks increased in the study period. The maximum value was 10.43 while the mean value of logarithm of asset was found to be 7.5. The findings conclude that most microfinance banks adopted modern technologies like debit and credit cards and ATMs which contributed to increased profitability of microfinance banks in Kenya.

4.3 Pearson Product Moment Correlation Coefficient

The Pearson's correlation is a measure of the strength and direction of association that exits between two variables on at least an interval scale. Below are the results of the findings presented in table 4.2 below:

Table 4.2 Pearson Product Moment Correlation Coefficient

	ROA	Debit and Credits	Number of ATMs	Operating Efficiency	Logarithm of Assets
ROA	1				
Debit and Credits	.122	1			
Number of ATMs	.189	.624**	1		
Operating Efficiency	-.829**	-.043	-.082	1	
Logarithm of Assets	.001	.144	.232	.456**	1

Source: Research findings

From the above findings in table in table 4.2 above, the results found that there was no correlation between debit and credit cards, number of ATMs, logarithm of assets and financial performance. The correlation scores are as follows: .122, .189 and .00. It was further revealed that there was a strong correlation between operating efficiency and financial performance of microfinance banks. The correlation score was found to be -.829. . The findings therefore conclude that the adoption of modern technologies contributed to improved efficiency of microfinance banks in Kenya.

4.4 Regression Analysis and Hypothesis Testing

Regression analysis was used to test the hypothesis of this study whether ICT investment contributed to financial performance of microfinance banks in Kenya. The results are shown in table 4.3 below:

4.4.1 Model Summary

The model summary depicts the summary of the model. It consists of the multiple correlation, the coefficient of determination and the adjusted R square. Below are the results of the findings in the table 4.4

Table 4.3 Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.923[a]	.852	.833	.01968

a. Predictors: (Constant), LA, Debit and Credit, Operating Efficiency, ATMs

From the above results in table 4.3, coefficient of determination is explained by 85.2% of the variance in the dependent variable (ROA). This means that the model is a good predictor.

4.4.2 Analysis of Variance

The study conducted analysis of variance to test the goodness of fit for the data below are the results of the findings in the table 4.4 below:

Table 4.4 Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.067	4	.017	43.288	.000[b]
	Residual	.012	30	.000		
	Total	.079	34			

a. Dependent Variable: ROA

b. Predictors: (Constant), LA, Debit and Credit, Operating Efficiency, ATMs

From the above results in table 4.4, the F-statistics which is used to test the level of significance between the independent and the dependent variable was found to be .0000 which is below 5%. This is an indication that the model is reliable in predicting the relationship between ICT investments contributed to financial performance of microfinance banks.

4.4.3 Model Coefficients

The study tested the model coefficients to determine the direction of the variables in the regression model. The results are provided in the table 4.5 below.

Table 4.5 Model Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.001	.009		-.072	.943
	Debit and Credit	9.585E-007	.000	.021	.239	.813
	ATMs	-3.726E-005	.000	-.019	-.208	.836
	Operating Efficiency	-.069	.005	-1.039	-12.865	.000
	LA	.007	.001	.476	5.755	.000

a. Dependent Variable: ROA

From the above findings, the linear regression model is as follows;

$ROA = -.001 + 9.585E\text{-}007X_1 - 3.726E\text{-}005X_2 - 0.069X_3 + .007X_4$

ATMs and operating efficiency were excluded from the regression model because they had a negative relationship with financial performance of microfinance banks. These findings contradict with the hypothesis of this study which had predicted a positive relationship between ICT investment and financial performance of microfinance banks in Kenya.

From the regression model obtained above, holding all the other factors constant, a unit increases in debit and credit cards issued results into a corresponding increase in ROA by 9.585E-00. Similarly, a unit increase in logarithm of assets leads to a corresponding increase in ROA.

From the model coefficients; logarithm of assets and operating efficiency were found to be statistically significant in the model. This is because their probability values were less than 5%. The results were as follows p=0.000 and p=0.001

On the other hand, debits and credit cards were found to be statistically insignificant because their probability (p)-values were above 5%. The result were as follows p=0.813 and p=.836 respectively.

4.5 Chapter Summary and Discussions

The descriptive results concludes that there was a rapid increase in the adoption and use of modern technologies in the study period for instance the use of debit and credit cards and ATMs which contributed to increased profitability of microfinance banks in Kenya.

The correlation results found that even though advancement and use of modern technologies in most microfinance banks was still low it contributed to increased efficiency and costs reduction. These findings are consistent with Mwangi (2012) who found that the information communication technology led to improved financial performance of Commercial Banks in Kenya.

The regression results concluded that the coefficient of determination was explained by 85.2% of the variance in the dependent variable (ROA). This meant that the model was a good predictor. Analysis of variance found that F-statistics was.0000 which is below 5%. This was indication that the model is reliable in predicting the relationship between ICT investments contributed to financial performance of microfinance banks. It was also observed that logarithm of assets and operating efficiency variables are statistically significant in the model. This is because their probability values were less than 5%. These

findings are consistent with a study by Juma (2012) which concluded that ICT improved the operations and the asset quality of commercial banks in Kenya.

The results were as follows p=0.000 and p=0.000. On the other hand, debits and credit cards were found to be statistically insignificant because their probability (p)-values were above 5%. The result were as follows p=0.813 and p=.836 respectively. These findings contradict the conclusions of Agboola (2001) who indicated that ICT investment like debit and credit cards contributed to profitability of commercial banks in Nigeria.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the study findings, conclusion and recommendations. The chapter is presented in line with the objective of the study which was to to establish the relationship between ICT investment on financial performance of microfinance banks in Kenya.

5.2 Summary of Findings

The descriptive results indicated that financial performance increased rapidly within the study period (2010-2014). It was estimated at 1%. The findings revealed that debit and credit cards issued within the study period increased by 65.8% which was an indication that most microfinance banks invested in modern technologies. The number of ATMs increased in the study period by an estimated 7%. The level of operating efficiency of microfinance banks was 1.008. This means that even though most microfinance banks adopted modern technologies only few were able to make maximum use of technology resources to generate revenues. This is because most of their operating ratio was above 50% which is regarded as the maximum optimal ratio. The assets portfolio of microfinance banks increased in the study period. The maximum value was 10.43 while the mean value of logarithm of asset was found to be 7.5. The findings conclude that most microfinance banks adopted modern technologies like debit and credit cards and ATMs which contributed to increased profitability of microfinance banks in Kenya.

The correlation results indicate there was no correlation between debit and credit cards, number of ATMs, logarithm of assets and financial performance. The correlation scores are as follows: .122, .189 and .00. On the contrary, there was a strong correlation between operating efficiency and financial performance of microfinance banks. The correlation score was found to be -.829

The regression results found that the coefficient of determination is explained by 85.2% of the variance in the dependent variable (ROA). This meant that the model was a good predictor. Analysis of variance found that F-statistics was.0000 which is below 5%. This was indication that the model is reliable in predicting the relationship between ICT investments contributed to financial performance of microfinance banks. It was also observed that logarithm of assets and operating efficiency variables are statistically significant in the model. This is because their probability values were less than 5%. The results were as follows p=0.000 and p=0.000. On the other hand, debits and credit cards were found to be statistically insignificant because their probability (p)-values were above 5%. The result were as follows p=0.813 and p=.836 respectively.

5.3 Conclusion

The study there concludes that the microfinance banks should continue investing in modern technologies like ATMs and issuance of debit and credit cards. This is because these kinds of technologies play an integral role of increasing access to financial services to customers in an efficient and effective manner. This brings about increased cost reduction and thus improves financial performance.

The study established that found strong positive correlation between financial performance of MFBs and size of the bank that study also revealed that large banks are subject to greater market discipline as evidenced by a higher sensitivity of their funding costs to risk proxies, suggesting that they are often too big to save. Stable microfinance banks obtain a large share of their income in the form of non-interest income such as trading income and fees and this contributes to financial performance of MFBs in Kenya.

5.4 Recommendations

Based on the study findings, the study recommend that MFBs should continue investing in ATMs as this was found to have positive influence on financial performance. This can be achieved by explaining to the customers the benefits of using ATMs so that they can realize the need to utilize the facilities and enjoy flexibilities and affordable services without necessarily visiting the banking halls. This will lead to increased sales and financial performance of microfinance banks in Kenya.

The study recommends that central bank of Kenya should set policies and procedures on the issuance of debit and credit cards to protect the consumers who use these products. Commercial banks should educate their customers on how to use these cards and the risks involved.

The study also recommends that to effectively serve its clientele, MFBs should adapt growth strategies that will help to win the clients trust thus enjoying the benefits of large scale by creating a platform for building branch networks and ATMs as a way of reaching out to many customers across the country.

5.5 Limitations of the Study

Data collection was limited to secondary sources. It is important to consider using primary data to get first-hand information on the issuance of debit and credit cards and use of ATMs. This will enrich the findings and provide a clearer picture on the relationship between ICT investment and financial performance of microfinance banks.

The study was itself to nine microfinance banks that were in operation between 2010-2014. It is imperative to consider carrying out a more comprehensive examination on the relationship between ICT investment and financial performance in the entire banking industry to find out whether these facts will still hold.

5.6 Suggestion for Further Studies

This study limited itself to MFBs operating within the boundaries of Kenya, this recommends that further research should be done on the effect of ICT investment in other developed countries whose investment in ICT is high inorder to get reliable facts on the extent to which ICT investment contribute to financial performance in microfinance banks.

The study also suggests that future studies could involve looking for the reasons behind the use of financial investments by the MFBs. Is it for profitability, enhancement, or for other reasons like competitiveness, liquidity? Hence, future studies should focus on the relationship between financial innovations and liquidity of MFBs

This study focused on the e-commerce products and services adopted by MFBs banks and the benefits and challenges they face in adopting these services. Further studies can

be focused on the perceptions of customers towards the e-commerce services offered by the banks. It will also determine the benefits derived and challenges faced by customers who use such services.

Lastly, the study suggests that future research to be conducted on the financial risks associated with mobile banking, internet banking and all the ICT investments mentioned in the study and the strategies that MFBs have put in place to tackle them

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APPENDIX I: LIST OF MCIROFINANCE BANKS IN KENYA

Choice Microfinance Bank Limited
Postal Address: P. O. Box 18263 – 00100, Nairobi
Telephone: +254-20-3882206, 20-3882207, 0736662218
Email: info@choicemfb.com, enquiries@choicemfb.com
Website: www.choicemfb.com
Physical Address: Siron Place, Magadi Road, Ongata Rongai
Date Licenced:13th May 2015
Branches: 1

Faulu Microfinance Bank Ltd
Postal Address: P. O. Box 60240 – 00200, Nairobi
Telephone: +254-20- 3877290 -3/7, 38721883/4
Fax: +254-20-3867504, 3874875
Email: info@faulukenya.com, customercare@faulukenya.com
Website: www.faulukenya.com
Physical Address: Faulu Kenya House, Ngong Lane -Off Ngong Road
Date Licenced:21st May 2009
Branches: 27

Kenya Women Microfinance Bank Ltd
Postal Address: P. O. Box 4179-00506, Nairobi
Telephone: +254-20- 2470272-5, 2715334/5, 2755340/42
Pilot Line: 070 - 3067000
Email: info@kwftdtm.com
Website: www.kwftdtm.com
Physical Address: Akira House, Kiambere Road, Upper Hill,
Date Licenced:31st March 2010
Branches: 24

SMEP Microfinance Bank Ltd
Postal Address: P. O. Box 64063-00620 Nairobi
Telephone: 020-3572799 / 26733127 / 3870162 / 3861972 / 2055761
Fax: +254-20-3870191
Email: info@smep.co.ke info@smep.co.ke info@smep.co.ke
Website: www.smep.co.ke
Physical Address: SMEP Building - Kirichwa Road, Off Argwings Kodhek Road
Date Licensed:14th December 2010
Branches: 6

Remu Microfinance Bank Ltd
Postal Address: P. O. Box 20833-00100 Nairobi
Telephone: 2214483/2215384/ 2215387/8/9, 0733-554555

Email: info@remultd.co.ke info@remultd.co.ke info@remultd.co.ke
Physical Address: Finance House, 14th Floor, Loita Street
Date Licensed: 31st December 2010
Branches: 3

Rafiki Microfinance Bank Ltd
Postal Address: 12755-00400 Nairobi
Telephone: 020-216 6401
Cell - phone: : 0719 804 370/0734 000 323
Email: info@rafiki.co.ke
Website: www.rafiki.co.ke
Physical Address: : 2nd Floor, El-roi Plaza, Tom Mboya Street
Date Licensed:14th June 2011
Branches: 3

Uwezo Microfinance Bank Ltd
Postal Address: 1654-00100 Nairobi
Telephone: 2212917 / 9
Email: info@uwezodtm.com
Website: www.uwezodtm.com
Physical Address: Park Plaza Building, Ground Floor, Moktar Daddah Street
Date Licensed: 08 November 2010
Branches: 2

Century Microfinance Bank Ltd
Postal Address: P. O. Box 38319 – 00623, Nairobi
Telephone: +254-20- 2664282, 20 6768326, 0722 168721, 0733 155652
Email: info@century.co.ke
Physical Address: KK Plaza 1st Floor, New Pumwani Road, Gikomba
Date Licensed: 17th September 2012
Branches: 1

Sumac Microfinance Bank Ltd
Postal Address: P. O. Box 11687-00100, Nairobi
Telephone: (254) 20 2212587, 20 2210440
Fax: (254) 2210430
Email: info@sumacdtm.co.ke
Website: www.sumacdtm.co.ke
Physical Address: Consolidated Bank House 2nd Floor, Koinange Street
Date Licensed: 29th October 2012
Branches: 1

U&I Microfinance Bank Ltd
Postal Address: P.O. Box 15825 – 00100, Nairobi
Telephone: (254) 020 2367288, Mobile: 0713 112 791

Fax: (254) 2210430
Email: info@uni-microfinance.co.ke
Website: http://uni-microfinance.co.ke/uni-microfinance/
Physical Address: Asili Complex Building 1st Floor, River Road
Date Licensed: 8th April 2013
Branches: 2

Daraja Microfinance Bank Ltd
Postal Address: P.O. Box 100854 – 00101, Jamia, Nairobi
Telephone: 020-3879995 / 0733 988888/0707 444888 / 0718 444888
Email: daraja@darajabank.co.ke
Website: www.darajabank.co.ke
Physical Address:Karandini Road, off Naivasha Road
Date Licensed: 12th January 2015
Branches: 1

Source (CBK, 2015): Quarterly Report