

**EFFECT OF TECHNOLOGICAL FINANCIAL INNOVATIONS ON FINANCIAL
PERFORMANCE OF MICROFINANCE INSTITUTIONS IN KENYA**

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DECLARATION

I, the undersigned, declare that this is my original work and has not been previously presented for the award of any degree in any other university.

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DEDICATION

This project is devoted to family for instilling in me virtues of hard work and discipline.

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ABBREVIATIONS

ATMs: Automated Teller Machines

CBK: Central Bank of Kenya

EFTs: Electronic Funds Transfer

IDT: Innovation Diffusion Theory

MFB: Micro Finance Bank

MFIs: Micro Finance Institutions

POS: Point of sale

R&D: Research and Development

ROA: Return on Assets

RTGS: Real Time Gross Settlement

SPSS: Statistical Package for the Social Sciences

ABSTRACT

Being innovative can potentially establish a competitive edge for financial institutions such as MFIs. This is because, innovative MFIs can expand their market through establishment of new channels of product distribution, new products and new markets.

The objective of this study was to assess the effect of financial innovations on financial performance of microfinance institutions in Kenya. This study was based on three theories: The Financial Intermediation Theory, Innovation Diffusion Theory and transaction cost innovation theory. The target population for this study was all microfinance institutions in Kenya. Secondary data was collected from 2014 to 2018. Data was collected for a period of 5 years. This study adopted descriptive statistics where data was analysed using descriptive statistics such as mean and standard deviation. The study also used inferential statistics in which a multiple regression model was developed in order to assess the effect of technological financial innovation on financial performance of the microfinance institutions. The study concludes that financial innovation and firm size have a strong and significant relationship with ROA. Liquidity showed a positive relationship with ROA, although the relationship was weak. On the other hand, a negative relationship was established between credit risk and financial performance of MFI's

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Financial Innovation in the financial sector is essential component in the growth and sustainability of the economy. Due to globalization and stiff competition being experienced in the financial sector, innovation has been observed as the only way out to remain competitive and being sustainable in the financial sector. Financial firms have put a lot of emphasize on the financial innovation in order to achieve high customer satisfaction, increase their market share and enhance the profitability of the firm (Tidd and Pavitt, 2011). Financial innovation is a new paradigm in the financial sector to improve the operational efficiency and enhance the profitability of the firms (Lawrence and Scott, 2001).

This study was based on three theories : The Financial Intermediation Theory, Innovation Diffusion Theory and transaction cost innovation theory. Ndebbio (2004) notes that financial intermediation brings together the surplus units and deficit units together ensuring that they can save and borrow respectively. This theory is crucial because it provides insights on how financial institutions such as MFIs operate in order to mediate between those with surplus and those with deficits. Innovation Diffusion Theory focuses on explaining how new technology and ideas spread among organisations (Rogers, 1962). This theory is important because it provides insights on how innovations

diffuse to the microfinance institution sector. Transaction cost theory which was developed by Hicks & Niehans (1935) emphasized on the financial innovation as the way out to reduce the transaction cost which can stimulate growth in the profitability of the firm.

Microfinance institution sector has experienced remarkable changes in the last few decades which majorly has been due to deregulations and adoption of technological tools (Lawrence, 2010). It is true to suffice that technology has advanced because organizations are constantly looking for opportunities to enhance efficiency of processes. Technology has enabled the undertaking of microfinance institution transactions in a variety of mediums. According to Hasan, Schimiedel and Song (2010) technology has provided microfinance institutions with several channels of delivering products and services to their customers. This is because, innovations seek to establish new ways of delivering services more efficiently than before. For instance, agency banking ensures that customers have access to microfinance institution services closer to their homes. Gorton and Metrick (2010) notes that innovations in the microfinance institution sector are led by the need to offer customized services, enhance accountability, eliminate those costs associated with traditional microfinance institution systems and develop markets. Microfinance institution innovations are crucial because they foster competitiveness of microfinance institutions in a given economy (Lawrence, 2010).

1.1.1 Technological Financial Innovations

There are several definitions of what really constitutes technological financial innovations. According to Gardeva and Rhyne (2011) technological financial innovations is the process through which financial institutions harness the capabilities of Information and Communication Technology (ICT) in establishing new products and services and new ways of rendering microfinance institution services. As such, the term denotes to establishment of new products and service by financial services. Equally, Jack and Suri (2010) notes that innovations in the microfinance institution sector aim at enhancing service delivery thereby enlarging the market share of the specific financial institutions.

An innovation is a new product, service or channel of production. It could also mean an improved version of an existing product or method of production. According to Lawrence (2010) innovations seeks to establish more efficient systems than the previous systems. It therefore means that innovations are only beneficial if they lead to cost savings, reduction of time for carrying out activities, enhanced service delivery, improved stakeholders' relations and improved access to products and services. Innovations are developed in order to establish competitive advantage (Mabrouk & Mamoghli 2010). Innovations calls for a lot of care before adoption since where they involve huge capital outlay, failure to successfully adopt them may lead to massive losses.

Al-Jabri (2012) indicates that most innovations involve technological advancement. In this respect, development of technology is an important impetus to innovations. The need

to establish a competitive edge has been attributed to be a major factor that makes firms engaged in Research and Development (R&D). According to Atman (2013) a firm that needs to achieve the generic goals of survival, growth and sustained profitability ought to have innovation being one of its strategic goals. This is because it is only through offering innovative products that firms can be market leaders in their niches.

1.1.2 Financial Performance of Firms

Financial performance is a firm's capacity to generate profits. Profit is total income generated by a firm at a given trading period. A firm is said to be operating efficiently when it is capable of generating profits (Dietricha & Wanzenried, 2009). A profitable firm is capable of generating profits. A profitable firm is capable of generating adequate return on capital (Harward & Upton, 1961). Therefore, a firm's financial performance is its capability to utilise the resources at its disposal to generate sustainable profits that will in addition strengthen its capital base by retaining earnings to ensure future profitability and maximise shareholders' wealth.

Performance entails the analysis of outputs with regards to the inputs (Pandey, 2010) In this respect, performance denotes the reporting of how input materials are utilized in the process of achieving organizational goals. It is important to note that performance may be high or low depending on the actual results in comparison to the expected results. According to Alam (2012) performance seeks to ascertain whether entities are efficient in resource use. Performance can be measured in terms of financial results or using non-financial parameters (Bagorogoza & Waal, 2010).

According to Tavitiyaman, Zhang and Qu (2012) financial performance entails measures that depict the profitability of organizations, productivity and growth. This implies that financial performance provides information on how efficient resources are used in income generation, how the resources lead to sustained performance or how a firm increases in size. Thus, financial performance indicates if financial goals are being met or not (Bakar & Ahmad 2010). Evidently therefore financial performance would be of much interest to the shareholders than it is for any other stakeholders of the firm.

Shareholders are keen on the ability of firms in making revenue which is sufficient to cover costs and leave enough residual that can be distributed as dividends to them (Mabrouk & Mamoghli 2010). Several methods have been used to measure financial performance. For instance, Bagorogoza and Waal (2010) views that the profitability and profits are a good measure of financial performance. Thus, financial performance equates resources and profits that have earned in a given time period.

Muiruri and Ngari (2014) measured performance of MFIs in terms of profits. According to Al-Hussein and Johnson (2009) the efficiency of how financial goals are being achieved is what constitutes financial performance. In other words, financial performance is the measure of how entities achieve their financial goals. In this respect, their measured financial performance of microfinance institutions in Saudi Arabia in terms of Return on Assets . This study measured financial performance in terms of Return on

Assets. Return on Assets (ROA) seeks to measure financial performance as the amount of income over total assets. In other words, it is a profitability measure that shows how the firm utilizes its assets in generating income.

1.1.3 Technological Financial Innovations and Financial Performance

Performance of MFIs is crucial since the entities exist to make profits for the shareholders through efficient resource use. Thus, management of MFIs are motivated to adopt new technologies with the aim of streamlining activities, leading to costs reduction and ultimately improving profitability (Nader, 2011). According to McKay and Pickens (2010) through adoption of branchless banking platforms, MFIs are able to acquire competitive advantage and improve performance. Perhaps, this can be related to the aspect that branchless platforms are cheaper to maintain since there are not labour intensive as in the case of traditional microfinance institution halls.

In particular, agency banking reduces the establishment expenses for MFIs since they are owned by other investors and not the MFIs. According to Gutu (2014) use of technologically enabled tools in the Romanian microfinance institution sector has helped reduces costs of doing business. This means that adoption of innovative service delivery channels is a cost saving measure for MFIs. It is important to note that cost cutting measures aims at increasing the profitability of entities.

Innovations such as internet banking , use of Automated Tellers Machines and agency banks reduces overheads for MFIs (Khravish & Al-Sadi, 2011). Thus,

innovations foster's customer satisfactions and at the same time can potentially improve performance of MFIs. According to Onay, Ozsoz and Helvacioğlu (2008) offering microfinance institution services online In Turkey was found to be of value to the MFIs. This is because, online microfinance institution makes the initiation and completion of microfinance institution transactions faster and cheaper than in the brick and mortar case.

Electronic microfinance institution derives its benefits through high customer satisfaction and reduction of the moral hazard. Online microfinance institution enables the customers to tract their transactions and obtain MFIs reports in a timely fashion. On the side of the MFIs, information retrieval is fast and less costly thus impacting positively on performance. More so, financial innovations are vital in dealing with competition in the market (Muiruri & Ngari, 2014)

1.1.4 Microfinance institutions in Kenya

Kenya's MFBs supports investments in small-scale that generates revenues that yields sufficient return on the investment from unrealized market activities (Kiiru, 2013). Microfinance Act 2006 of Kenya sets requirements to streamline the operations of MFBs. It sets minimum statutory capital requirements together with minimum statutory liquid assets, licensing conditions, stipulates time of submission of financial accounts and returns to Central Bank, guides supervision conducted by Central Bank and sets limits on credit facilities. The licensed MFBs accept funds from the public whilst contributing to the alleviation of poverty and still in compliance with minimum regulatory requirement of financial safety and soundness.

MFBs in Kenya are of two kinds. A nationwide MFB is one licensed to engage in microfinance business of deposit-taking in any particular area of Kenya while a community MFB is restricted to engage in microfinance business of deposit-taking within only one Government Administrative District, Division or a region specified by the Central Bank (CBK, 2015). Currently, there are thirteen Microfinance Institutions in Kenya which include Faulu MFB, Kenya Women MFB, Rafiki MFB, Remu MFB, SMEP MFB, Uwezo MFB, Century MFB, SUMAC MFB, Caritas MFB, U & I MFB, Daraja MFB, Maisha MFB and Choice MFB. All these MFBs have their Headquarters in Nairobi (CBK, 2017).

1.2 Research Problem

Being innovative can potentially establish a competitive edge for financial institutions such as MFIs. This is because, innovative MFIs can expand their market through establishment of new channels of product distribution, new products and new markets. Due to stiff competition in the financial sector, MFIs need to be innovative in order to remain profitable (Mabrouk & Mamoghli 2010). In this respect, MFIs engage in financial innovations to improve service delivery which is believed to foster the chances of making profits by the firms. Malhotra and Singh (2009) views that financial innovations aid in cost management but when empirically tested in India, financial innovations did not offer much financial benefits. Therefore, MFIs adopt financial innovations to improve organizational performance and remain competitive. However, innovations tend to differ with respect to the timings of adoption (Learner & Tufano 2011).

According to Brugger (2004) the MFIs like any other financial institution need to increase the value to their customers, reduce risks, increase the deposits levels and loans levels and reduce the transaction costs of the customers. Financial innovation has been seen as the only way out the microfinance institutions can be able to increase their operational efficiency which will ultimately improve their profitability. Financial innovation is essential in the microfinance institution for it influences the financial performance of the firm, thus the financial innovation in the microfinance through institution, product and process innovation are the main contributor to the enhancement of the profitability of the microfinance institutions. It is true that financial innovations have been adopted by MFIs with the intention of fostering performance. Among the innovations are use of ATMs, EFTs, RTGS, cheques truncation systems, agency banking, mobile banking and internet banking. Most microfinance institutions have at least a single of these innovations.

Various empirical studies globally and local scholars have examined the themes of financial innovation and performance. Ngumi (2014) evaluated the consequence of financial innovations in the financial markets and revealed that financial innovations were of value to banks. On the contrary, Muiruri and Ngari (2014) revealed that some aspects of financial innovations (mobile transactions, transacting through agents and performing microfinance institution transactions by use of cards was not effective in fostering banks' profits. Simiyu, Ndiangui and Ngugi (2014) specifically sought to assess

if customer satisfaction was influenced by adoption of financial innovations. This contradiction results forms the motivation of this study. This study is undertaken to be able to compare the findings of other global, regional and local studies. None of the studies have focused on the effect of technological financial innovation on financial performance of MFI and in connection to that, this research sought to fill the research gap by answering the following research question, what is the relationship between technological financial innovations and financial performance of microfinance institutions in Kenya?

1.3 Research Objective

The objective of this study was to assess the effect of financial innovations on financial performance of microfinance institutions in Kenya.

1.4 Value of the Study

The study is of value to management practice. The findings of the study will greatly benefit the managers of MFIs in that it will provide statistical evidence on impact of innovations. A deep understanding of technological financial innovations and its impact on financial performance of microfinance institutions in Kenya is instrumental in assisting the management of MFIs in making decisions in respect to their adoption. Therefore, the findings can be used as basis of planning on market and product developments.

This study is of value to the theoretical understanding of the concepts of technological financial innovations. Thus, the study may benefit other researchers as it may provoke the undertaking of more studies. The presence of literature about innovations and its effects on financial performance is important for MFIs and also to other players in the financial sector.

Thirdly, this study can be used a tool of policy formulation. The findings can be useful to the Central bank of Kenya in making of policies on MFIs governance. The CBK regulates microfinance institutions in Kenya. For this reason, the findings can be used in provision of information that is pertinent in policy formulation with especially with respect to adoption of technological financial innovations among microfinance institutions in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This is the second chapter of the study and contains the theories of the study, empirical review, research gaps and conceptual framework.

2.2 Theoretical Review

This proposal was based on three theories: financial intermediation theory, innovation diffusion theory and transaction cost theory of Financial Innovations.

2.2.1 Financial Intermediation Theory

Financial Intermediation theory was developed by Gurley and Shaw (1960). This theory depicts how a financial sector facilitates savings and borrowings in an economy. The theory was coined by Bisihnano (1992) who identified that financial intermediation is the process that ensures those with excess funds can save them and those with deficits have somewhere to borrow from. In this respect, the theory views that savings and borrowing forms the fundamental operation of financial institutions. This is to mean that there is a need to ensure that people can access financial services as and when they require them. Ndebbio (2004) notes that financial intermediation brings together the surplus units and deficit units together ensuring that they can save and borrow respectively. This theory therefore views that depositor's loan to MFIs who then give out loans to borrowers.

According to Diamond (1984) there are financial market frictions that results due to existence of information asymmetry and transaction costs. In this respect, where their frictions are hazardous to a certain class of people, accessing such services becomes elusive due to high costs or due to lack of information. It is for this reason that financial intermediaries exist to solve these problems.

According to Demirgüç-Kunt, Asli, Beck, and Honohan (2008) financial intermediations seeks to explain how those with negative spending can access finances from those with positive spending. As a result, due to information asymmetry, financial institutions exist to cover the gap. It is true to suffice that it is not possible for individual's lenders to find individuals borrowers easily. The theory posits that individuals' loans to financial institutions since it is an effective mechanism for savings as opposed to loaning to individual borrowers.

This theory is crucial to this study because it provides information on how financial systems operates. Financial institutions obtain funds from depositors who in turn loan to borrowers. The introduction of technological innovations has ensured that even those in rural areas can access microfinance institution services through such platforms such as agency banking and mobile banking. In addition, the low-income earners may access mobile loans when in need and this is basic theme of the intermediation theory. The theory posits that the existence of financial institutions is to provide a platform where

those with surplus funds can loan to those with deficits. Therefore, this theory forms a good basis of understanding financial innovations.

2.2.2 Innovation Diffusion Theory

This theory was first proposed by Rogers (1962) with the aim of explaining what subtle factors lead to spread of innovations across industries. The theory intended to explain the process involved in new technology and ideas spread among organisations. Rogers viewed that new technological adoption was a time based process which involves decision making situations among members of a social setup. He characterized that diffusion of innovation followed five factors which were awareness, interest, evaluation, trial and lastly adoption. According to Sevcik (2004) an innovation is an item or process that a given social system views as new relative to existing ones. It is for this reason that Lundblad and Jeniffer (2003) idealises that before innovations can fully take shape in a market, their inputs and outputs should be seen to be measurable and satisfactory to the users. The technology should be relatively easy to use and thus be able to attract the users.

Innovation Diffusion Theory (IDT) focuses on the new item characteristics. In this regard, the theory views that acceptability of new technologies are triability, complexity compatibility, observability and relative advantage are prerequisite features that determines successful spread of innovations (Mas & Morawczynski, 2009). This means that technological tools should fulfil those features before they are adopted. Innovations must have benefits for them to be successfully adopted by the intended users. In connection to

this study, technological innovations should be characterised with ease of use in order to be adopted in the market. Liu and Li (2009) cites that IDT is a good hypothesis that provides valuable information on the how innovations spread and adopted by consumers in an economy.

IDT is pertinent to this study because it shows the process of new technological innovations adoptions in a social set up. The adoption of technological innovations is meant to widen the market base of financial institutions. Having noted this, it is therefore true to suffice that adoption of innovations has a potential of enhancing financial performance due to increased markets. Such tools such as use of ATMS and mobile banking makes carrying out microfinance institution transactions convenient and cheaper as opposed to visiting the traditional microfinance institution halls.

2.2.3 Transaction Cost Innovation Theory

The transaction cost innovation theory was developed by Hicks and Niehans (1952). The theory recognized on dominant factor of the financial innovation as a way of reducing the costs associated with the financial transactions. The theory further elaborated on the need to advance the transaction innovation as it enhances on the financial services being offered by the financial institutions. The theory gives the perception of the microscopic economic structure change that gives a radical reason of financial innovation in order to provide benefits to the financial institutions. One of the major causes of financial innovations is to control transaction costs in any MFI. Transaction requires time, which comprises both costs and time to gather information which can only be controlled by

employing appropriate process and products innovation. Minimizing costs increase profit opportunity enhances positive financial performance (Levich, 1988).

One of the major causes of financial innovations is to control transaction costs in any firm. Financial services need time of operations which consumes both costs and the time needed to gather information. Reducing costs enhance profit opportunity hence improved positive financial performance (Levich, 1988). The theory is essential in the study for it emphasizes on the need to implement innovation in the financial sector in order to reduce the financial cost associated in the financial transaction.

2.3 Determinants of Financial Performance

Financial performance is influenced by a variety of factors that which may be related to financial innovations or otherwise.

2.3.1 Financial Innovations

Theoretically, financial innovations are expected to reduce the costs of doing business for the MFIs and this can improve profitability (Lyons, Chatman & Joyce 2007). Adoption of technology ensures that large volume of bank's transactions can be undertaken in less time as it would be for brick and mortar bank. Equally, innovations tends' to offer more channels through which customers can access microfinance institution services and for more hours in a day. For instance, ATMs, mobile banking and internet banking enable customers to transact for 24 hours. This may result to more income for bank since there are transaction charges for the transactions. Theoretically, ATMs, mobile banking, EFTs

and RTGS are expected to improve profitability for the MFIs due to increase in distribution channels (Stavins, 2011).

According to Mabrouk and Mamoghli (2010) innovations are tools that establish the competitive advantage of MFIs and this creates a favorable edge in the market. For instance, a MFI that has adopted internet banking and agency banking may have a better brand image than a bank has not. More importantly, successful adoption of financial innovation is regarded as strategic moves by MFIs. Kingoo (2011) views that use of ICT tools enhances productivity of staff, offers cost reduction avenues and provides accurate risk monitoring methods. Nofie (2011) also reveals that innovations obviously result to improved versions of products or channels which are cost efficient thus improving profitability of MFIs. As such, innovation tends to increase the channels of distributing a bank's product which can increase customer satisfaction thereby aiding in customer acquisition as well as customer retention.

2.3.2 Credit Risk

Microfinance institutions are involved in offering financial services to a wide range of customers. It is vital that the MFIs offer credit facilities to those clients that are credit worth in order to reduce the frequency of incurring non-performing loans. In this respect it is therefore important for MFIs to manage credit risk appropriately. According to Dang (2011) credit risk is the chance that the loans awarded to customers won't be repaid. Thus, credit risk is the probability of borrowers defaulting from their loan obligations. This hampers the profitability of microfinance institutions because loan defaults leads to

loss of interest which is the main income source of microfinance institutions. Microfinance institutions should therefore formulate credit policies that are appropriate in ensuring that credit risk is kept as low as possible and where practical, non-performing should be eliminated. This same sentiment is maintained by Sangmi and Nazir (2010) who views that credit risk is one of the major determinants of profitability of microfinance institutions.

2.3.3 Liquidity

Liquidity focuses on the capacity of firms to pay their short terms as they become payable. In this respect, liquidity tends to express whether entities can repay debts as they become payables. According to Ifeacho and Ngalawa (2014) liquidity of MFI's is important because it ensures that MFIs can clear off liabilities without falling into financial distress. Microfinance institutions usually have liabilities which they may owe other banks or federal banks. In order to avert plunging into financial distress, microfinance institutions should therefore keep adequate current assets to clear off current liabilities. However, maintaining a large portion of assets in liquid state interest income is lost because long term assets earn income.

2.3.4 Firm size

Another element of financial performance is the firm size, is significant characteristic to gain performance. Large firms have more resources and capacity to undertake more invention lines leading to high production resources in an organization. This enables the firm to improve financial performance

since they can mitigate risks (Alvarez & Barney, 2001). Small firms are more flexible; larger companies have better prerequisite's behavior in comparison to medium or small firms. The reason why larger firms have better equipped to involve with a number of networking mutually in width and depth that is, networking intensity with the actors, with other organizations as well as outside the banking industry (Pais &Stork, 2011). Firm size can be measured using total assets.

2.4 Empirical Review

Akhisar, Tunay and Tunay (2015) undertook a study on effect of innovations on bank's performance in Turkey. The study adopted a descriptive research design where secondary data was collected from twenty-three nations. The study sought to assess the effect of credit cards and debit cards , point of sales , ATMs and internet banking. It was revealed that both POS and internet banking had a negative effect on performance of banks. On the contrary the ratio of ATMs to bank branches had positive effect on performance. The study concluded that ATMS are beneficial to banks since they improve performance. This study was carried out in Turkey and involved both developed countries and developing nations.

Malhotra and Singh (2010) did a study in India with the purpose of ascertaining the role of financial innovations. In particular, the study assessed internet banking by collecting data eighty-two banks for a period of ten years up to 2007. The study was motivated by the existence of literature that depicted that financial innovations had tangible results on performance. However, the study revealed that neither internet

banking nor experience in internet banking had effect on performance of the Indian lenders.

Cherotich et al. (2015) assessed the role of innovations on banks' performance. Due to the purpose of the study a descriptive research design was deemed fit. All banks were considered in data collection since aggregate data was adopted which was collected from records of the Central Bank of Kenya. The period of analysis was five years up to 2013. The Regression model revealed that cheques, EFTs and RTGS significantly influence variations in Return on Assets. More so, all these variables had positive and statistically significant impact on performance of the banks.

Another study was done by Gichungu and Oloko (2015) with the aim of establishing whether banks performance was affected by bank innovations. The study purposed to assess of agency banking, use of ATMs, online microfinance institution and mobile banking had effect on bank's performance. Secondary data was mined from bank's annual reports. Descriptive statistics were used to report the findings. The regression model revealed that these variables significantly influenced performance. More so, all these variables were establish to be statistically significant in influencing performance of the institutions. Also, all the variables were revealed to be significant determinants of financial results of the entities.

Muriungi (2014) carried out a study to establish influence of financial innovation on financial performance of deposit taking micro finance institutions in Kenya. All deposit-taking microfinance institutions with branches in Nairobi were involved in this study. Stratified sampling method was used and respondents were drawn from all the three main management staff levels of the head office branches from the 8 deposit-taking MFIs. Both primary and secondary data were used. Secondary data was accessed from the CBK (2012) report. Both qualitative and quantitative analysis was carried out. Statistical tool, SPSS, was used to code and enter quantitative data. The following recommendations were made: For organization to be effect on its financial performance particularly financial institution they must recognize product innovation. This due to the realization 23 that consumers are changing their preference as the innovation, in order to have large market share, organization have to adopt the modern marketing strategies in order to fit in the current market needs and organizations have to embrace process innovation.

Mugo (2012) carried out a study to establish the influence of financial innovation on the growth of microfinance institutions in Kenya. He studied 34 registered MFIs by the CBK by the year 2012. The findings of the study showed that most MFIs have come up with innovations of new services such as mobile banking, business current and savings accounts, SMEs loans, school fees loans, financial and managerial trainings. In a bid to grow their firms, other MFIs have internetworked their offices, opened new branch networks and innovated new products. Besides innovation, there was positive and strong

relationship between financial growth and a variety of other reasons such as attending to specific needs of clients, the need for client retention and to reduce transaction time. The survey's conclusion was that MFIs's financial innovations lead to accumulative growth of the firms in several dimensions such as products lines, market size, volumes of credit sales and the overall level of profitability.

Okombo (2014) carried out a study to investigate the impact of Electronic Banking on financial performance of Deposit Taking Micro Finance Institutions in Kisii, Kenya. The target population of this survey was the DTMs in Kisii town and specifically the employees in these DTM. The random sampling was used to identify eight defendants in the DTMs in Kisii County. Data was collected using questionnaires. The study utilized the descriptive research design and the questionnaire as means of data collection. The census sampling method was used for sampling. There was significant statistical (positive) relationship between the low transaction costs and financial performance. Results from findings established that decrease on the transactional costs leads to improved financial performance among the Microfinance Institutions.

2.5 Conceptual Framework

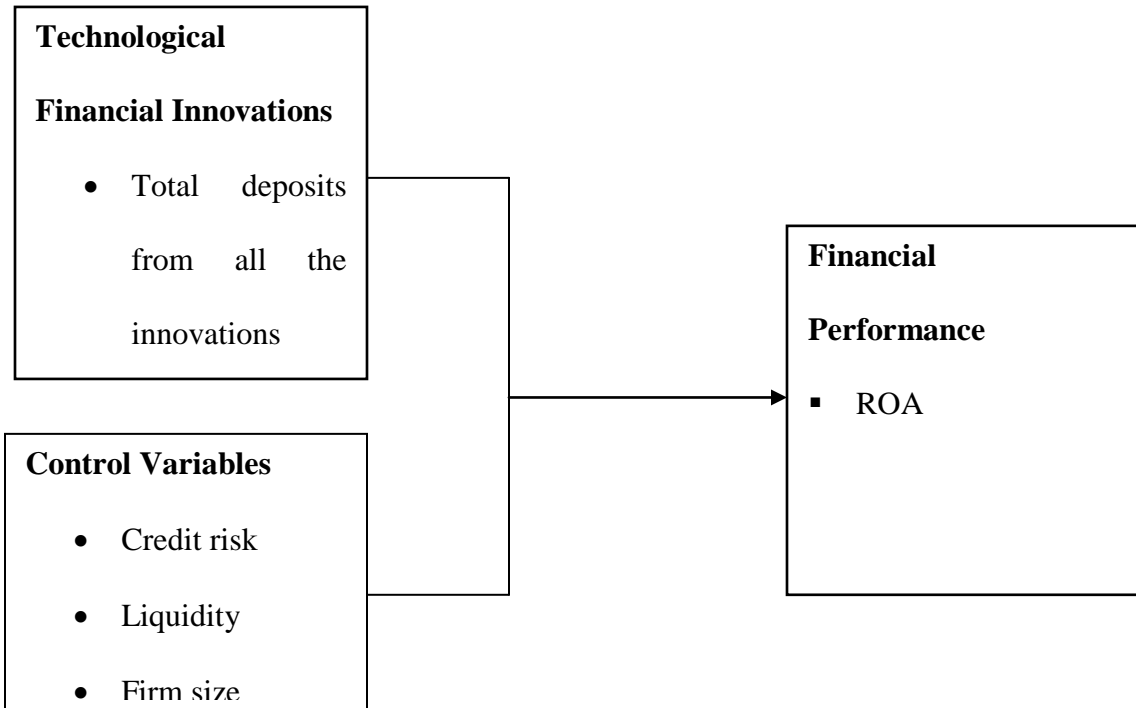
A conceptual framework is a flow chart that shows the hypothesised relationship between independent and dependent variables. Independent variables are those variables that are not influenced by others. Dependent variable is that variables that is expected to be influenced by other variables. The dependent variable for this study was financial performance. The expected relationship between the variables is that technological

financial innovations had a significant and positive effect on the financial performance of microfinance institutions. Also, it was expected that liquidity and firm size had a positive effect on the financial performance of microfinance institutions while credit risk had a negative effect.

Figure 2.1: Conceptual Framework

Independent Variable

Dependent Variable



Source: (Author, 2019)

2.6 Summary of Literature Review

The literature reviews has provided a theoretical review of the study. In this respect, the chapter entailed a discussion of theories that subtly expounds on the study variables. These theories are financial intermediation theory, innovation diffusion theory and Silver Constraints theory of innovations. Also, the chapter has discussed the theoretical relationship between financial innovations and performance of MFIs. The study variables were also conceptualized to provide a hypothesized relationship among variables. Further, this chapter has a review of global and local studies that are pertinent to this

study which has helped in identification of the gap to be filled. The literature has shown that innovations can potentially led to enhanced performance or hamper performance. On the same line, the studies found differing significance of innovations. More so, few studies have been done in Kenya on MFIs since majority have focused on banks. As a result of these contradicting results and the fact that there is need to compare findings, this study is justified. The study objective is to provide evidence of how innovations affects performance of firms, case of MFIs in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter deals with the subject of the research design that this study employed, the target population, methods of data collection, data presentation and analysis techniques among others.

3.2 Research Design

The study employed descriptive research design. This design shows variable relationships being studied (Saunders, 2007). According to Creswell (2008), a descriptive study should be able to answer the what, where and how questions of an event. This research design is considered to be aligned with this research since it shows the relationships between technological financial innovations and the financial performance of the microfinance institutions in Kenya. The study collected only quantitative data using secondary data which was obtained from financial reports of the study population.

3.3 Target Population

A target population defines the set of all items that forms the basis of a given study. According to Cooper and Schindler (2013) a target population is a complete set of elements and units that a given study seeks to make inferences on. The target population

for this study was all microfinance institutions in Kenya. This included 13 microfinance institutions in Kenya which were in operation from 2014 to 2018, Appendix 1 (Association of Microfinance Institutions, 2018; Central bank of Kenya). A census approach was used hence the whole population formed the sample.

3.4 Data Collection

Secondary data was collected from 2014 to 2018. Data was collected for a period of 5 years. This period was suitable because it was the period that Kenya had experienced tremendous developments in terms of financial innovations. The secondary data in this study was obtained from the various financial statements which had been published by the various microfinance institutions.

3.5 Diagnostic Tests

Diagnostic tests were employed in the study to ascertain the reliability of the outcome. Autocorrelation and Multicollinearity tests were mainly diagnosed. Multicollinearity Test to ensure the data collected is free from biasness and one variable data is not related to another variable data, the study conducted a multicollinearity test. Whenever the values of VIF is between 1 and 10, then there is no multicollinearity while when the VIF is less than 1 or greater than 10, then there is presence of multicollinearity. When the test fails you should standardize the continuous variables by choosing on a standardization method on the regression dialog box. For instance you may choose variable centering approach (Cohen, West & Aiken, 2013). For Heteroscedasticity test the study applied Breusch Pagan to determine the consistency of the variance across the observation.

Heteroscedasticity occurs in cases in which variance is different across the observation. This may lead to a biased estimation.

3.6 Data Analysis Technique

This study adopted descriptive statistics where data was analysed using descriptive statistics such as mean and standard deviation. The study also used inferential statistics in which a multiple regression model was developed in order to assess the effect of technological financial innovation on financial performance of the microfinance institution institutions. The study used SPSS version 23 in data analysis.

3.6.1 Analytical Model

The study used this multiple regression model:

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

Where:

Whereas Y = Financial Performance measured by Return on Assets (net income / average total assets)

X₁ = Financial innovation (log of total deposits)

X₂ = Credit Risk of MFI (Gross non performing loans/Gross loans and advances)

X₃ = Liquidity (Current ratio)

X₄ = Firm size (Log of total assets)

β₀ = is the constant to be estimated by the model

$\beta_1, \beta_2, \beta_3,$ and β_4 = Coefficients indicating influence of independent variables on the dependent variable.

ε_t = error term in the model

3.6.2 Tests of Significance

The study carried out at 95 % confidence level indicating that the margin of error is 5 %. The F-test was computed to explain the overall effect of technological financial innovation on financial performance. The study measured the statistical significance of variables by evaluating the P-Value. Variable was significant if the P-Value was less than 0.05 which is the alpha value at 95 % confidence level.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter presents the analysis and the results of the study. The overall aim of this study was to investigate the effect of financial innovations on financial performance of microfinance institutions in Kenya. The independent and control variables were financial innovation, credit risk, liquidity as well as firm size. Microfinance institutions in Kenya' financial performance was the dependent variable. The investigation was founded on the obtained data from use of financial report reviews.

4.2 Descriptive Statistics

Descriptive Statistics explains the qualities of each variable in the form of the minimum, maximum, mean, standard deviation, skewness and kurtosis. Table 4.1 shows these qualities as follows.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	65	.01	.36	.1029	.08953
Financial innovation	65	4.62	6.08	5.3889	.41858
Credit risk	65	.43	.81	.6226	.08350
Liquidity	65	.15	.73	.4502	.15736
Firm size	65	6.24	10.32	8.0135	1.23738

Source: (Author, 2019)

From the data received from MFI's in Kenya (Table 4.1), the findings indicate that the mean average ROA was 10.29% for the firms researched on, suggesting that microfinance institutions in Kenya have a relatively moderate average return on assets with a standard deviation of 0.08953, the indication is that microfinance institutions in Kenya financial performance vary quite significantly. The average deposits from financial innovations during (2014-2018) was Kshs. 244,849,938.9 (antilog. of 5.3889), with a maximum of Kshs. 1,102,264,435 (antilog. of 6.08) and a minimum of Kshs. 41,686,938.35 (antilog of 4.62). The mean of credit risk was 0.6226 with a standard deviation of 0.8350, the mean of liquidity was 0.4502 with a standard deviation of 0.15736. The average size of assets in these MFI's (firm size) during (2014-2018) was Kshs. 103,157,307.9 (antilog. of 8.0135), with a maximum of Kshs. 20,892,961,309 (antilog. of 10.32) and a minimum of Kshs. 1,737,800.829 (antilog of 6.24).

4.3 Diagnostic Tests

To determine the suitability of the data for statistical analysis, various tests were conducted. The tests that aimed at establishing if the data fulfilled the cardinal requirements of classical linear regression analysis included: normality test, multicollinearity test, autocorrelation test as well as the heteroscedasticity test. Where violation to these assumptions were detected, appropriate remedies were applied. This section therefore presents the results of various diagnostic tests carried out on the data together with the relevant remedial treatment undertaken to ensure suitability of the data

4.3.1 Tests of Normality

Shapiro-Walk W test which is a more conclusive test than the graphical method was conducted. The results are as presented in table 4.2.

Table 4.2: Shapiro-Wilk Test of Normality

Variables	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
ROA	0.204	65	0.433	0.870	65	0.467
Financial innovation	0.357	65	0.642	0.853	65	0.534
Credit risk	0.089	65	0.200	0.966	65	0.097
Liquidity	0.063	65	0.174	0.968	65	0.090
Firm size	0.093	65	0.206	0.965	65	0.061

Source: (Author, 2019)

The null hypothesis under this test is that the disturbances are not normally distributed. If the p-value is greater than 0.05, the null of normality at the 5% level was to be rejected. Given that p-value were 1 greater than 5% for the residual, the null hypothesis is rejected and thus the conclusion that the residuals are normally distributed.

4.3.2 Test for Multi-collinearity

Multicollinearity inflates the standard errors and gives spurious results hence it is necessary to test for presence of multicollinearity before running an ordinary least square regression model. This study used a variance management efficiency factor

(VIF) method to test for multicollinearity of the study variables. The results as shown in Table 4.3 revealed that there was no presence of multicollinearity since all the values of VIF were below 10. This implies that the use of regression model in estimating the effect of technological financial innovations on the financial performance of microfinance institutions in Kenya was justified.

Table 4.3: Test for Multi-collinearity

	Collinearity Statistics	VIF
	Tolerance	
ROA	.500	2.000
Financial innovation	.608	1.645
Credit risk	.633	1.580
Liquidity	.498	2.008
Firm size	.866	1.155

Source: (Author, 2019)

The results in Table 4.3 present variance inflation factors results and were established to be less than 10 and thus according to Field (2009) indicates that there is no Multicollinearity

4.3.3 Autocorrelation test

To establish whether the residual is serially correlated over time, Durbin Watson test for autocorrelation was conducted. The null hypothesis is that no first order serial /auto correlation exists. The results are as indicated in Table 4.4 below

Table 4.4: Autocorrelation test

Test	Statistic
Durbin Watson	2.187

Source: (Author, 2019)

The null hypothesis of no autocorrelation is accepted and therefore residuals are not auto correlated (2.187 is more than 2)

4.3.4 Heteroscedasticity

This study used the Breusch-Pagan test to detect Heteroscedasticity. The results are presented on Table 4.5

Table 4.5: Heteroscedasticity

Breusch-Pagan	
chi2(4)	= 12.82
Prob > chi2	= 0.1122

Source: (Author, 2019)

The Table 4.5 below indicate that the error term are homoscedastic, given that the p-value is greater than the 5% (0.1122), hence the null hypothesis of constant variance was rejected.

4.4 Inferential Statistics

4.4.1 Pearson's Correlation Coefficient Analysis

The correlation analysis presents the strength of relationship between the variables. Pearson correlation was preferred to analyse the connection between the predicted and the predictor variables. The magnitude of the linear relations was measured using correlation coefficient (r). The value of r is assumed to be between -1 and +1. For $r = +1$, implies perfect positive (+) correlation, 0 means no correlation, -1 means the variables are perfectly negatively correlated. The nearer to +1, the stronger the relationship whereas the nearer to -1, the meagre the relationship between the variables.

Correlation analysis measures the relationship that exists between the variables. The study undertakes a Pearson correlation that measures the linear relationship of variables. A correlation of 1 shows a perfect positive correlation while correlation of 0 or value close to zero shows no relationship or weak relationship respectively. -1 value, shows a negative perfect relationship and values close to it have strong negative relationship. The table 4.6 shows the value of Pearson correlations for the variables.

Table 4.6: Correlations

	ROA	Financial innovation	Credit risk	Liquidity	Firm size
ROA	1				
Financial innovation	0.74	1			
Credit risk	-0.21	-0.13	1		
Liquidity	0.16	0.21	0.34	1	

Firm size	0.63	0.05	0.12	0.11	1
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Source: (Author, 2019)

With reference to Table 4.6 financial innovation as well as firm size showed a strong relationship with ROA which was significant (Pearson's $r = 0.74$ and 0.63 respectively) respectively. Liquidity showed a positive relationship with ROA, although the relationship was weak (Pearson's $r = 0.16$). On the other hand, a negative relationship was established between credit risk and financial performance of MFI's as indicated by Pearson r value of -0.21 .

4.4.2 Regression Analysis

The study used regression analysis to determine relationships of dependent variables with independent factors. The results of regression model comprises of the model summary, variance analysis and a summarization of the coefficients.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.889 ^a	0.790	0.753	0.896

Source: (Author, 2019)

The findings on table 4.7 indicate that R square value is 0.790, which is an indication that 79% variation on financial performance among microfinance institutions in Kenya due to changes in financial innovation, credit risk, liquidity and firm size at 95% confidence interval.

Table 4.8: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.223	4	3.0558	8.0147	0.00003
	Residual	22.876	60	0.3813		
	Total	35.099	64			

a. Predictors: Financial innovation, credit risk, liquidity, firm size

b. Dependent Variable: ROA

Source: (Author, 2019)

Table 4.8 shows that the F statistics value of 8.0147 was significant as indicated by the P value of $0.00003 < 0.05$. This is an indication that regression model was fit and also acted as a good predictor of the correlation of the research variables.

Table 4.9: Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	3.936	0.451		8.727	0.000
Financial innovation	0.741	0.213	0.646	3.478	0.001
Credit risk	-0.667	0.179	0.526	-3.726	0.001
Liquidity	0.519	0.214	0.432	2.425	0.016
Firm size	0.602	0.206	0.547	2.922	0.004

Source: (Author, 2019)

The overall regression model for this model was:

$$Y = 3.936 + 0.741X_1 - 0.667X_2 + 0.519X_3 + 0.602X_4.$$

Financial innovation has a positive influence on financial performance. It indicates that any unit increase in the financial innovation will cause financial performance to increase by 0.741. Increase in credit risk was confirmed to cause a decrease in the financial performance due to the negative effect by -0.667. Liquidity positively increases the financial performance by 0.519. Also, firm size of the firm increases financial performance positively by 0.602.

4.5 Discussion of Findings

The study revealed that financial innovation had a positive impact on financial performance of MFI's firms. The study findings revealed that technological financial innovations is necessary to achieve proper functioning of financial institutions and achieve their stated vision and mission if well implemented. These are in line with the findings of Momanyi (2017) which concluded innovations positively impacted the financial performance of Kenyan commercial banks following a survey on innovations and their effect on the financial performance from 2010 to 2016. He used a total of 58 Kenyan commercial banks and the sample of the research was 10 registered Kenyan commercial banks. Secondary data was collected from NSE for analysis by employing multiple linear regression model which was to test for the relationships of innovations and financial performance. He argued that, for commercial banks to remain competitive, they must continue to be creative and innovative. Adoption of technology ensures that large volume of bank's transactions can be undertaken in less time as it would be for brick and mortar bank. Equally, innovations tend to offer more channels through which

customers can access microfinance institution services and for more hours in a day. For instance, ATMs, mobile banking and internet banking enable customers to transact for 24 hours. This may result to more income for bank since there are transaction charges for the transactions. Theoretically, ATMs, mobile banking, EFTs and RTGS are expected to improve profitability for the MFIs due to increase in distribution channels (Stavins, 2011). Similarly, According to Mabrouk and Mamoghli (2010) innovations are tools that establish the competitive advantage of MFIs and this creates a favorable edge in the market. For instance, a MFI that has adopted internet banking and agency banking may have a better brand image than a bank has not. More importantly, successful adoption of financial innovation is regarded as strategic moves by MFIs. Kingoo (2011) views that use of ICT tools enhances productivity of staff, offers cost reduction avenues and provides accurate risk monitoring methods. Nofie (2011) also reveals that innovations obviously result to improved versions of products or channels which are cost efficient thus improving profitability of MFIs. As such, innovation tends to increase the channels of distributing a bank's product which can increase customer satisfaction thereby aiding in customer acquisition as well as customer retention.

The study found out that credit risk significantly and negatively affects financial performance of MFI's in Kenya. Credit risk is the chance that the loans awarded to customers won't be repaid. In this respect, an increasing in non-performing loans tends to lower interest income for banks. These findings agrees with those of Sangmi and Nazir (2010) who views that credit risk is one of the major determinants of profitability of

commercial banks in Pakistan. It is true to suffice that when credit risk management of banks is not effect in mitigating credit risk, non-performing loans would increase and this is not profitable for MFI's. Credit risk management seeks to establish a risk management framework that is robust not to lower loans uptake but still that which can low the level of nonperforming loans.

Liquidity was also found to positively influence financial performance. Liquidity is the ability of a business to pay off debts as they mature. This finding agrees with those of to Ifeacho and Ngalawa (2014) who established that Ifeacho and Ngalawa (2014) liquidity of MFI's is important because it ensures that MFIs can clear off liabilities without falling into financial distress. Microfinance institutions usually have liabilities which they may owe other banks or federal banks. In order to avert plunging into financial distress, microfinance institutions should therefore keep adequate current assets to clear off current liabilities. However, maintaining a large portion of assets in liquid state interest income is lost because long term assets earn income.

The findings of the study support theories such as innovation diffusion theory, where financial technology as a new innovation is spread throughout the commercial banks in Kenya, in order to achieve better financial performance. The result of the study also supports the proposition by various studies that had previously been conducted. Nyanga (2013) agreed that mobile money improved performance of SMEs in various towns in Kenya. Gitau (2011) and Kilonzi (2015) all indicates that mobile banking technology creates competitive advantage that leads to improved performance of various companies

in various industries. FinTech can be described as technology-enabled financial solutions that cover up the whole commodities' scope conventionally offered by banks (Arner 2015). FinTech is also explained as a new form monetary service trade that merges IT with monetary services such as remittances, payments and also management of assets (Lee & Kim, 2015). A financial business comprised of firms that exploit technology to create efficient to the monetary systems (McAuley, 2015)

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

It entails brief review of the findings, conclusions and recommendation.

5.2 Summary of Findings

This study aimed at assessing how financial performance of the microfinance institutions in Kenya was influenced by technological financial innovations. The study findings showed a positive relationship between technological financial innovations and financial performance. Due to challenges faced by many organizations during the period of global financial challenges, many business organizations have resorted to sound technological financial innovations mechanisms to improve their performance.

The study found out that credit risk had a negative effect on financial performance of MFI's in Kenya. Credit risk is measured by the rate of non-performing loans as a percentage of gross loans. In this line, an increase in credit risk due to increase in non-performing loans is expected hamper the financial wellness of financial entities. This is due to the loss of interest income because of a deteriorating assets. Loans are the main income earning assets of most lenders. Thus where credit risk is not effectively managed leads to increase in non-performing loans thus lowering the profits of MFI's.

The study found that liquidity improves performance of MFI's in Kenya. In addition it was revealed that the effect of liquidity on financial performance was notably significant.

MFI's liquidity is crucial as it denotes the ability of the financial entities to service call deposits, grant loans and meet other obligations as and when they become payable. For this reason, an adequate liquidity prevents MFI's from plunging into financial distress. Liquidity of MFI also tends to send signals to the stakeholders on the ability of MFIs to meet financial obligations. In this respect, where liquidity is greatly compromised performance tends to be hampered.

R square value was 0.790, which is an indication that 79% variation on financial performance among microfinance institutions in Kenya due to changes in financial innovation, credit risk, liquidity and firm size at 95% confidence interval.

5.3 Conclusion

From the study, the correlation coefficient obtained, financial innovation and firm size showed a strong and significant relationship with ROA, (Pearson's $r = 0.74$ and 0.63 respectively) respectively. Liquidity showed a positive relationship with ROA, although the relationship was weak (Pearson's $r = 0.16$). On the other hand, a negative relationship was established between credit risk and financial performance of MFI's as indicated by Pearson r value of -0.21 .

The study established that credit risk negatively and significantly impacts financial performance of MFI's. Credit risk if not effectively handled can result to financial crisis particularly when loans are not being serviced. Credit risk is conventionally measured by the rate of non-performing loans of lenders. Low percentage is an indication of an

effective risk management framework. Conversely, it shows that risk management is not helpful in terms of risk identification, assessment and control. Credit risk is a major concern for all financial institutions whose main business is lending.

The study concluded that liquidity has a positive effective on financial wellness of MFI's. In addition, the study concluded that the relationship existing between the two variables is significant. MFI liquidity is a critical aspect that is actually enforced by the Central Bank of Kenya. Perhaps, this can be attributed to the fact that liquidity enables MFIs to settle call deposits and regular deposits and other financial obligations when required to do so. To this end, liquidity of MFIs is an important ingredient towards ensuring that the stability of the individual MFI and entire sector is maintained.

5.4 Recommendations

The MFIs are urged to invest in the innovation and adoption of highly efficient financial systems especially anchored on technology that bring speed, ease of use, easy accessibility and cost saving to customers. This is a baseline requirement that will ensure customer retention, high transaction volumes per time which translate into transaction charges that feed into bank income and hence profitability. Recommendation is also given to the government through its financial sector regulators to put in place regulation frameworks and policies that create conducive environment for MFIs to innovate and at the same time provide adequate controls around the resulting financial systems.

Also, the study recommends that MFI's should establish an effective risk management framework in order to reduce the negative effect of credit risk. In this light, appropriate credit risk management would aid in reduction in non-performing loans. Non-performing leads to loss of interest income. This is because loans are the major income earning assets of MFI's

The implementation of the above recommendations will see the Kenyan economy grow tremendously due to the resulting speed and integrity of doing business transactions in Kenya. A technological financial innovation in MFI's ensures an efficient and secure financial system which attracts both local and global investors not only in the financial sector but also in other economic sectors. Therefore both the public and private financial system players need to participate in financial innovations

5.5 Limitation of the Study

The researcher faced time constraint. Given that the study utilized secondary data which was obtained from all the registered MFI's in Kenya. The time was limited for the entire data collection exercise and analysis. However, the limited available time, it was well utilized.

This research was conducted over a five year period which may not be as conclusive as if a much longer period was used for example twenty years. When a period of study is longer it means more data is utilized which guarantees more conclusive outcomes from the study unlike when the period of study is very short. Perhaps undertaking a similar study in a longer period of time may lead into different conclusions. In addition, the

inclusion of control variables may have potentially interfered with the exact position in respect to effect of technological financial innovations on financial performance of the entities under consideration. However, MFI' financial performance is not solely influenced by technological financial innovations and therefore it was necessary to include the selected control variables

5.6 Suggestions for Future Research

This study considered MFI subsector only, thus it would be of value to carry out a further study on other private financial institutions. Such study would be of high interest since profit making is mostly the main objective of private entities especially in the financial sector. This would also provide a basis for comparison thus more informed decision making would be done with regards to investments and level of financial innovation inputs required in either sectors.

Another suggestion for further study would be on the factors that affect financial innovation amongst public MFIs in Kenya. This would be useful to MFIs' management in putting up strategies that mitigate on negative factors that slow the much needed financial innovations as well as embracing factors that spur innovations for improved bank performance. This would also inform decision makers in terms of innovation investments which have a direct impact on the larger economy.

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APPENDICES

Appendix I: List of Microfinance Banks in Kenya

1. Faulu Kenya
2. Choice Microfinance Bank
3. Kenya Women Microfinance Trust
4. SMEP Microfinance
5. Century Microfinance
6. Uwezo Microfinance
7. Rafiki Microfinance
8. Remu Microfinance Bank Ltd
9. Sumac Microfinance Bank Ltd
10. U&I Microfinance Bank Ltd
11. Caritas Microfinance Bank
12. Daraja Microfinance Bank
13. Maisha Microfinance Bank Ltd

Source: Central Bank of Kenya website (2018)

Appendix II: Raw Data

	Net Income (Ksh. 000)	Total Assets (Ksh. (Ksh. 000))	ROA	Financial innovatio n	Credit risk	CA	CL	Liquidity	Firm Size
Faulu Kenya									
2014	264277.38	6606934.48	0.04	4.68	0.48	2074577.43	6101698.32	0.34	6.82
2015	618575.46	5623413.25	0.11	5.15	0.53	1765751.76	3838590.78	0.46	6.75
2016	195911.53	4897788.19	0.04	5.43	0.56	1537905.49	4394015.69	0.35	6.69
2017	2318195.07	7244359.6	0.32	5.62	0.58	2274728.91	3729063.79	0.61	6.86
2018	2918434.69	9120108.39	0.32	5.85	0.62	2863714.04	4545577.84	0.63	6.96
Choice Microfinance Bank									
2014	1150879.87	57543993.73	0.02	4.64	0.59	18068814	120458760.2	0.15	7.76
2015	6628155.45	60255958.61	0.11	5.11	0.65	18920371	32621329.31	0.58	7.78
2016	5810888.06	64565422.9	0.09	5.38	0.68	20273542.8	67578475.97	0.3	7.81
2017	8538718.28	77624711.66	0.11	5.57	0.71	24374159.5	44316653.56	0.55	7.89
2018	19507932.4	81283051.62	0.24	5.8	0.77	25522878.2	48156373.98	0.53	7.91
Kenya Women Microfinance Trust									
2014	2818382.93	28183829.31	0.1	4.69	0.48	8849722.4	27655382.5	0.32	7.45
2015	4944472.69	30902954.33	0.16	5.16	0.53	9703527.66	64690184.4	0.15	7.49
2016	2818382.93	28183829.31	0.1	5.44	0.56	8849722.4	31606151.43	0.28	7.45
2017	4037644.13	28840315.03	0.14	5.63	0.58	9055858.92	28299559.13	0.32	7.46
2018	1040210.55	34673685.05	0.03	5.86	0.62	10887537.1	20542522.83	0.53	7.54
SMEP Microfinance									
2014	135537.66	3388441.56	0.04	4.62	0.55	1063970.65	1636877.92	0.65	6.53
2015	108923.42	3630780.55	0.03	5.09	0.61	1140065.09	4071661.04	0.28	6.56
2016	35481.34	3548133.89	0.01	5.36	0.64	1114114.04	2532077.36	0.44	6.55
2017	106444.02	3548133.89	0.03	5.55	0.66	1114114.04	1989489.36	0.56	6.55
2018	148614.09	3715352.29	0.04	5.78	0.72	1166620.6	7291378.88	0.16	6.57

						2			
Century Microfinance									
2014	50947309.6	169824365.3	0.3	4.68	0.43	53324850.7	78418898.07	0.68	8.23
2015	12164605.8	173780082.9	0.07	5.14	0.47	54566946	151574850.1	0.36	8.24
2016	9270886.3	309029543.3	0.03	5.43	0.5	97035276.6	173277279.6	0.56	8.49
2017	38141053.6	346736850.5	0.11	5.61	0.52	108875371	184534527.2	0.59	8.54
2018	46773514.1	467735141.3	0.1	5.85	0.56	146868834	312486881.6	0.47	8.67
Uwezo Microfinance									
2014	3954770.22	131825673.9	0.03	4.7	0.5	41393261.6	243489774.1	0.17	8.12
2015	11832867.1	147910838.8	0.08	5.17	0.55	46444003.4	165871440.7	0.28	8.17
2016	25948961.6	162181009.7	0.16	5.45	0.58	50924837.1	86313283.15	0.59	8.21
2017	25948961.6	162181009.7	0.16	5.64	0.6	50924837.1	113166304.6	0.45	8.21
2018	30934914.6	181970085.9	0.17	5.87	0.65	57138607	139362456	0.41	8.26
Rafiki Microfinance									
2014	16372687.9	102329299.2	0.16	4.72	0.52	32131400	55398965.45	0.58	8.01
2015	25178508.2	125892541.2	0.2	5.19	0.57	39530257.9	146408362.7	0.27	8.1
2016	6054244.99	151356124.8	0.04	5.48	0.6	47525823.2	103317007	0.46	8.18
2017	13585949.2	169824365.3	0.08	5.67	0.62	53324850.7	93552369.63	0.57	8.23
2018	29931469.3	213796209	0.14	5.9	0.68	67132009.6	126664169.1	0.53	8.33
Remu Microfinance Bank Ltd									
2014	258261.69	6456542.29	0.04	4.76	0.59	2027354.28	4714777.4	0.43	6.81
2015	230175.97	5754399.37	0.04	5.23	0.65	1806881.4	5162518.29	0.35	6.76
2016	141589.16	7079457.84	0.02	5.52	0.68	2222949.76	10585475.05	0.21	6.85
2017	126191.47	6309573.44	0.02	5.71	0.71	1981206.06	2713980.9	0.73	6.8
2018	258261.69	6456542.29	0.04	5.95	0.77	2027354.28	3269926.26	0.62	6.81
Sumac Microfinance Bank Ltd									
2014	1074063.59	53703179.64	0.02	4.8	0.61	16862798.4	36658257.41	0.46	7.73
2015	655374.62	58884365.54	0.04	5.28	0.67	18489690.8	77040378.25	0.24	7.77

2016	1936962.69	64565422.9	0.03	5.57	0.71	20273542.8	30259019.09	0.67	7.81
2017	602559.59	60255958.61	0.01	5.76	0.73	18920371	82262482.61	0.23	7.78
2018	1982080.34	66069344.8	0.03	6	0.79	20745774.3	44139945.26	0.47	7.82
U&I Microfinance Bank Ltd									
2014	52134.02	1737800.83	0.03	4.83	0.55	545669.46	3410434.13	0.16	6.24
2015	279336.72	1995262.31	0.14	5.31	0.61	626512.37	1566280.93	0.4	6.3
2016	131265.7	2187761.62	0.06	5.6	0.64	686957.15	1107995.4	0.62	6.34
2017	23442.29	2344228.82	0.01	5.79	0.66	736087.85	1937073.29	0.38	6.37
2018	672883.7	2691534.8	0.25	6.04	0.72	845141.93	1565077.65	0.54	6.43
Caritas Microfinance Bank									
2014	182835276	4570881896	0.04	4.87	0.54	1435256915	3776991883	0.38	9.66
2015	1446143007	6025595861	0.24	5.35	0.59	189203710	7007544816	0.27	9.78
2016	662815545	6025595861	0.11	5.65	0.63	189203710	4300084319	0.44	9.78
2017	70794578.4	7079457844	0.01	5.84	0.65	2222949763	3269043769	0.68	9.85
2018	406415258	8128305162	0.05	6.08	0.7	2552287821	5430399619	0.47	9.91
Daraja Microfinance Bank									
2014	383921567	4265795188	0.09	4.71	0.56	1339459689	1860360679	0.72	9.63
2015	934219486	5495408739	0.17	5.18	0.62	1725558344	3383447733	0.51	9.74
2016	889572290	7413102413	0.12	5.46	0.65	2327714158	3637053371	0.64	9.87
2017	2578479982	9549925860	0.27	5.65	0.67	2998676720	5452139491	0.55	9.98
2018	4532131482	12589254118	0.36	5.88	0.73	3953025793	10135963572	0.39	10.1
Maisha Microfinance Bank Ltd									
2014	2438698052	8709635900	0.28	4.65	0.62	2734825672	5259280139	0.52	9.94
2015	300000000	1000000000	0.03	5.12	0.68	3140000000	5147540984	0.61	10
2016	1159424597	12882495517	0.09	5.39	0.72	4045103592	6223236296	0.65	10.11
2017	1327669526	16595869074	0.08	5.58	0.74	5211102889	14084061863	0.37	10.22
2018	1253577679	20892961309	0.06	5.81	0.81	6560389851	16821512438	0.39	10.32