EFFECT OF FINANCIAL INDICATORS ON FINANCIAL PERFORMANCE OF

MICROFINANCE INSTITUTIONS IN KENYA

BY

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DECLARATION

I declare that this Thesis is my original work and has never been presented for a degree award in this or any other university or institution of higher learning.

Mugun Wycliffe

Signature…………..   Date...…….

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This thesis on Effect of financial indicators on financial performance of Microfinance Institution in Kenya has been done under our supervision as Maseno University supervisors and submitted for examination with our approval.

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ACKNOWLEDGEMENT

DEDICATION

This thesis is dedicated to my dear parents Bishop Vincent Mugun and mother Teresa Mugun.

ABSTRACT

Microfinance is the provision of a broad range of financial services such as deposits, loans, payment services, money transfers and insurance to the poor and low-income households and their micro enterprises. The sector reaches out to 832,794 active borrowers with a loan book amounting to Kshs.28.6 billion and reporting 26.4 % annual growth in Kenya. However, owing to the fact that there is limited literature on the determinants of financial performance, various studies conducted indicate divergent views on the effect of financial indicators on financial performance. For this reasons it is not clear whether or not financial indicators affect financial performance of microfinance institutions (MFIs) in Kenya. The study focused on three plausible financial indicators namely debt to equity ratio, portfolio to assets ratio and operating expense ratio. The main objective of the study was to investigate the effect of financial indicators on financial performance of MFIs in Kenya**.** The specific objectives were to; find out the effect of debt to equity ratio on financial performance, examine effect of portfolio to assets ratio on financial performance and examine effect of operating expense ratio on the financial performance of MFIs in Kenya. The study was modeled on the Arbitrage pricing Theory and correlation research design adopted. Target population comprised 12 registered MFIs. Sample size consisted a panel data set of 12 MFIs selected using purposing sampling method for the period from 2009 to 2013 and secondary data was collected. Fixed effect model was the preferred model based on the Hausman specification but the study used random effect model since fixed effect model gave insignificant results.Breusch pagan LM test of heteroscedasticity in random effects was conducted to test if the variance of the residual term will be constant over different values of the explanatory variables. Random effect model results revealed that debt to equity ratio had a negative but insignificant relationship with return on assets ratio. Portfolio to assets ratio had a positive relationship with financial performance but the relationship was not significant. Operating expense ratio had negative and significant relationship with return to assets ratio. The coefficient for lagged return to assets ratio was 0.4733, debt to equity ratio was -0.0026, portfolio to assets ratio was 0.0090 and coefficient for operating expense ratio was -0.1857. P-values for DER was 0.878 , PAR, 0.686 and OER, 0.000.The results for lagged ROA the coefficient was positive and was statistically significant. Autoregressive distributed lag model on debt to equity ratio preferred model random effect model findings postulated that debt to equity ratio had positive and significant relationship with return to assets ratio. Lagged DER had positive and significant relationship with return to assets ratio. ARDL model on portfolio to assets ratio preferred model random effect findings revealed that PAR had positive and insignificant relationship with return to assets ratio. Lagged PAR had positive and significant relationship with return to assets ratio.ARDL model on operating expense ratio and preferred model fixed effect model showed that OER had negative and significant relationship with return to assets ratio. The lagged OER had positive and insignificant relationship with return to assets ratio .The study concluded that negative and significant effect of operating expense ratio on financial performance shows that an increase in expenses decreases the performance of the MFIs industry in Kenya and negative coefficient of OER implies that there is lack of efficiency in expense management of the MFIs industry in Kenya. The study recommends that AMFI should conduct audit to ensure that all MFIs maintain a proper balance between debt and equity, MFIs in Kenya should aim at formulating and implementing strategies that are likely to enhance rate of returns from their investment portfolios and MFIs should lower their interest rate to a level that would cover its operating expenses. The study would be significant in the provision of MFIs with proper decision making as well as provide the contextual information to researchers and scholars.

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LIST OF ABBREVIATIONS

AMFI - Association of Microfinance institutions in Kenya

ANOVA- Analysis of Variance

ARDL – Autoregressive Distributed Lag Model

CAPM- Capital Assets Pricing Model

CGAP - Consultative Group to Asset the poor

CBK - Central Bank of Kenya

DEA - Data Envelopment Analysis

DFA- Distribution Free Approach

DTMS - Deposit Taking Microfinance Institutions

FEM- Fixed Effect Model

FGLS - Feasible Generalized Square Estimation

FIML - Full Information Maximum Likelihood Estimation

GMM - Generalized Method of Moments

ITSUR- Iterative Seemingly Unrelated Regression

MBB - Micro-Banking Bulletin

MFIs - Microfinance institutions

NGOs - Non-Governmental Organizations

ROA - Return on Assets

ROE - Return on Equity

SACCO- Savings and Credit Cooperative Society.

SSA - Sub-Saharan Africa

SMEP - Small and Medium Enterprises

SFA- Stochastic Frontier Approach

UK - United Kingdom

US - United States

OPERATIONAL DEFINITIONS

Microfinance: This is the provision of banking services to lower income people, especially the poor (Christen et al., 2003)

Microfinance Institutions (MFIs): A microfinance institution is an organization that offers financial services to the poor. This includes a wide range of providers that vary in their legal structure, mission, methodology and sustainability. They however share the common characteristics of providing financial services to a clientele poorer and more vulnerable than bank clients (Ledgerwood & White, 2006)

Financial Performance: According to the business dictionary, financial performance involves the results of a firm's policies and operations in monetary terms. These results are reflected in the firms return on investment, return on assets and value added.

Return on assets: Return on assets reflects the ability of a bank's management to generate profits from the bank's assets. It shows the profits earned per Kenya shillings and indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off balance sheet activities, Tan & Florence (2012).

Debt to equity: The debt to equity ratio expresses the proportionate relationship between debt equity. The capital structure of a firm ,that is the ratio of debt to equity that a firm employs to finance its assets has for long been considered a major factor as it influences shareholders return and risk(pandey,2000)

Portfolio to assets: Loan portfolio is the yearly sum of assets invested in loans and advances expressed as proportion of the total portfolios and total portfolio is the sum of assets invested in loans and advances as well as in government securities whereas portfolio to assets ratio is the measure between gross loan portfolio and the Total assets, Muchomba, (2013)

Operating expense ratio: OER gives an overall measure of efficiency of a lending institution. For this reason the operating expense ratio is often refers to as the efficiency ratio .Mainly the OER measures the Institutional cost of delivering loan services (Stauffenberg *et al* ,2003).

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The Microfinance sector has evolved over the past three decades. It came to prominence in the 1980s, although subsidized credit programs to targeted communities date back to the 1950s and early experiments in Bangladesh, Brazil and a few other countries began in the 1970s (Aghion and Morduch,2005)

Microfinance refers to all types of financial intermediation services that include savings, credit funds transfer, insurance and pension remittances provided to low income households and enterprises in both urban and rural areas including employees in the public and private sectors and self-employed (Robinson, 2003; Adongo and Stork,2005).According to Basu *et al* (2004) MFIs complement effectively the formal banking sector in providing financial services to the unserved.Microfinance is a concept that postulates the credit to micro and small business,savings,cash transfers and insurance to the poor and low income people(Sa-Dhan,2003).It is a means by which fair financial services are made available to people who are prevented from participating in their countries formal financial sector (Orbuch,2011).

Performance of microfinance can be measured through profit sales and customer retention. The profits can be measured using return on assets (Munyambonera,2012).Return on assets reflects the ability of a bank's management to generate profits from the bank's assets. It indicates how effectively the bank's assets are managed to generate revenues, although it might be biased due to off balance sheet activities. This is probably the most important single ratio in comparing the efficiency and operating performance of banks as it indicates the returns generated from the assets that bank owns, Tan & Florence (2012).Return on assets ratio is the most comprehensive accounting measure of a banks overall performance (Birhanu,2012).Because of this, the bulk of studies employed ROA as performance measure, for instance Amdemikael (2012), Belayneh (2012) & Abebe (2014).

The financial indicators that are likely to affect return on assets ratio and may include debt to equity ratio, portfolio to assets ratio, operating expense ratio (Disanayake, 2012).The debt to equity ratio expresses the proportionate relationship between debt and equity. The capital structure of a firm, that is the ratio of debt to equity that a firm employs to finance its assets has for long been considered a major factor as it influences shareholders return and risk (pandey,2000).Firms with higher leverage position tend to have a capital structure that translates into a better performance (Modgiliani, 1958).This states that high leverage and profitability are positively correlated.Nevertheles, Rhyne and Otero (1992) observed somewhat different approach to Modgiliani(1958). They stated that Institutions which have high capital structure with equity tend to be more profitable. Loan portfolio is the yearly sum of assets invested in loans and advances expressed as proportion of the total portfolios and total portfolio is the sum of assets invested in loans and advances as well as in government securities whereas portfolio to assets ratio is the measure between gross loan portfolio and the Total assets (Muchomba, 2013). Operating expense indication gives an overall measure of efficiency of a lending institution. For this reason the operating expense ratio is often refers to as the efficiency ratio .Mainly the OER measures the Institutional cost of delivering loan services (Stauffenberg *et al* ,2003).To reduce costs delegation of costs can be diminished via diversification (Diamond, 1984).The underlying theme is that a focus on efficiency will help institutions to reach more clients and attain higher levels of profitability (Gerschick, 2000).

1.2 Concept and Scope of Micro Finance

According to Robinson, (1998) micro finance refers to the provision of a broad range of financial services such as; deposits, loans, payment services, money transfers and insurance products-to the poor and low income households for their micro enterprises and small businesses to enable them to raise their income levels and improve their living standards. Anan (2002) further elaborates this by describing the core principles of micro finance to include; access to appropriate financial services among the poor-micro financing is based on the premise that the poor has the capability to repay loans, pay the real cost of loans and generate savings, micro finance is an effective tool for poverty alleviation, microfinance institutions must aim to provide financial services to an increasing number of disadvantaged people, microfinance can and should be undertaken on a sustainable basis and microfinance NGOs and programs must develop performance standards that will help define and govern the micro finance industry towards

greater reach and sustainability. Gungen (2002) described the features of microfinance based on the type of client, lending technology, loan portfolio, organizational ideology and institutional structure. On the client type for micro finance, Gungen (2002) noted that clients are characterized by low income, employment in the informal sector, low wage bracket, lack of physical collateral, closely interlinked household/business activities.

According to Lafourcade, Isern, Mwangi and Brown, (2005) microfinance institutions (MFIs) in sub-Saharan Africa include a broad range of dispersed institutions that offer financial services to low-income clients; non-governmental organizations (NGOs); Non-bank financial institutions, cooperatives, rural banks, savings and postal financial institutions, and an increasing number of commercial banks. Overall, the prospects and processing of MFIs in Africa are dynamic and growing. Africa's MFIs appear to serve the broad financial needs of their clients by offering savings as a core financial service for clients and use it as an important source of funds for lending. MFIs in Africa tend to report lower levels of profitability, as measured by return on assets, than MFIs in other regions, in the world. Among the African MFIs, that provide information for Lafourcade *et al* (2005) research 47 percent posted positive unadjusted returns, regulated MFIs reported the highest return on assets of all MFI types, averaging around 2.6 per cent.The microfinance sector in Africa is expanding rapidly and the institutions have increased their activities. African MFIs are among the most productive globally as measured by the number of borrowers and savers. It's also reported the MFIs in Africa also demonstrate higher levels of portfolio quality with an average portfolio at risk of over 30 days of only 4 percent.

1.3 Microfinance Operation in Kenya

Micro finance is the provision of a broad range of financial services such as deposits, loans, payment services, money transfers and insurance to the poor and low-income households and their micro enterprises. Micro financing institutions (MFIs) are defined as institutions whose major business is the provision of micro finance services. Their aim is to become sustainable and expand their microfinance services (Asian Development Bank, 2000).

Micro finance refers to the provision of financial services to low income households, including the self-employed. These financial services include savings, credit, payment facilities, remittance and insurance (Ledgerwood 1999; Wright, 1999; Christen and Rosenberg 2000). Micro finance therefore encompasses micro-credit, micro-savings and micro-insurance. (Ruth 2002). With the passage of time, there has been increasing emphasis on the importance of offering a range of

quality, flexible financial services in response to a wide variety of needs of the poor (Wright, 1999).The financial sector is fairly developed and diversified. The formal financial sector includes among others commercial banks, various building societies and insurance companies. Alongside the formal banking sector exists a microfinance sector which over the past three decades has demonstrated remarkable growth in terms of outreach, professionalism, recognition and specialization (AMFI, 2013).

Microfinance is provided by a variety of institutions of different legal forms, under at least nine different Acts of Parliament. It is estimated that currently there are over 200 microfinance providers in Kenya. These microfinance providers can be clustered into three broad categories: formal, semi formal and informal institutions, with the level of formality defined by the degree of formal regulation and supervision (AMFI, 2013).

So far, the steady growth in the microfinance sector has mostly been realized by six mainstream financial institutions namely; Equity Bank, Cooperative Bank, K-Rep Bank (Sidian bank), Kenya Post Office Savings Bank as well as Family Bank and Kenya Commercial Bank (AMFI, 2013). Some of the developing models developed by these banks have far-reaching impact, influencing microfinance practices and other outreach modalities within the East Africa Region. Two of the institutions transformed into a bank to collect deposit and offer other banking services to the population considered unbankable K Rep (Sidian bank) and Equity (AMFI, 2013).The rest operate as either micro finance institutions, Trusts or NGOs. Currently, five institutions have scaled up their outreach and have countrywide network (K-Rep, Equity, KWFT, Family, SMEs). The rest are limited in some areas in districts and town centres main operations are loans and savings with those turned into banks extra services like forex and remittances.(AMFI, 2013).

There are estimated 3460 legally constituted microfinance providers as of June 2013.Also 3897 savings and credit cooperative, 56 micro finance institutions, 4 commercial banks, (K-Rep, Equity, Post Bank and Cooperative Bank) 2 building societies. Some micro finance institutions are members of International forum like K-Rep Bank, Equity bank, SMEP, Faulu. K-Rep bank received the CGAP (Consultative Group to Assist the Poor) award for the second time running. The government has created a rural finance department at the Central Bank of Kenya. A micro finance unit has been established at the Ministry of Finance. Microfinance are faced with myriad of challenges as indicated by Cooper (2013). Among these challenges include; unsupportive

legal and regulatory environment, limited donor funding, little support from the government, lack of right technical skills for the managers and staff of these institutions, poor infrastructure are hindering the operations of these institutions and lack of capital. This includes introduction of the products for SMEs and low income clients (down-sealing) as well as innovative outreach modalities such as mobile banking vehicles and smart card solutions. This development has improved the services available to both banking clients and MFI clients (AMFI, 2013).

AMFI (2013) has indicated that as at December 2013, the sector showed positive growth trend, reaching out to 832,794 active borrowers with a gross loan portfolio of KES 49.1 billion achieving a 15.7% annual growth. The total assets of the sector registered a stable growth over the last 3 years (2011, 2012, and 2013) amounting to 298.4 billion. The relative market share of the different segments remained stable with 9 microfinance banks (formally DTMs), 46 credit only MFIs and 5 commercial banks.

The credit only MFI is mostly concentrated in their core lending activity as the net portfolio accounts for 69.5% of their total assets. Overall the sector reaches out to 832,794 active borrowers with a loan book amounting to KES 28.6 billion, reporting a 26.4% annual growth. This is without the banks. The sector continues to play a key role in employment creation and as at December 2013, it had a workforce of over 6,000. The growth momentum is expected to be supported by the agency model and increased usage of mobile phone platforms through partnerships with mobile service providers. Kenya's microfinance sector comprises of nearly 250 MFIs with only 50 of these being registered with their umbrella body Association of Microfinance Institutions. Only nine of these are licensed by Central bank of Kenya to take deposits. The remaining institutions are unregulated and offer microfinance services in combination with other services. Association of Microfinance Institutions report (2013) indicated that the registered MFIs had a stable assets growth of 30.4% over the period under consideration and were worth over kshs.220 billion as of December 2011, up from kshs.129 billion as of December 2009.Its worth mentioning that equity bank independently accounted for 80.4 % of the segments total   assets. Actually the segments asset growth, without was less strong and fairly stagnant in 2012 ,with DTMS recording an adverse growth even with the improved number of deposit taking licenses approved that year.

1.4 Financial Indicators and Microfinance Performance

There are several studies that have found varied findings on the relationship between financial indicators and microfinance financial performance. A number of studies have found positive relationship albeit with varied methodologies.Munyambonera(2012) study using static dynamic panel; Gweyi and Karanja(2014) ; Disanayake et al (2010).

Munyambonera (2012) investigated the determinants of commercial bank performance in sub-Saharan Africa (SSA). The study used unbalanced panel data of 216 commercial banks drawn from 42 countries in SSA for the period 1999 to 2006. The findings revealed that both bank specific factors namely growth in bank assets, growth in bank deposits, capital adequacy, operational efficiency and liquidity ratio and macroeconomic factors such as growth in GDP and inflation explained the variation in commercial bank profitability over the study period. Gweyi and Karanja (2014) investigated the effect of financial leverage on financial performance of 40 deposit taking Savings and Credit Co-operative Societies in Kenya for the period 2010 to 2012. Results showed perfect positive correlation between debt to equity ratio with return on equity and profit after tax and positive correlation between debt to equity ratio with return on assets and income growth.

Though Munyambonera (2012) study considered more bank specific variables the study focused on financial liquidity specifically. The focus of the study was on commercial banks in Sub-Saharan Africa but this study will interrogate financial liquidity indicators which are debt to equity ratio, portfolio to assets ratio and operating expense ratio on microfinance institutions. On the other hand, Gweyi and Karanja (2014) used correlation analysis which does not infer causality .This study has used fixed and random effect panel data methods which are more robust in determining the relationship between financial indicators and microfinance institutions.

Dissanayake (2012) postulated that operating expense ratio, cost per borrower ratio and debt to equity ratio were statistically significant predictors in determining return on assets ratio. In addition, Dimitris *et al* (2013) results revealed that the competitive process reduces positions of abnormal profitability, albeit this is not immediate. There was also evidence that changes in regulation enacted during the 1990s affected both the level and persistence of bank profitability.

Hoffman (2011) examined the determinant of the profitability of US banks panel data during the period 1995-2007. The empirical findings documented a negative link between the capital ratio and profitability, which supported the notion that banks are operating over cautiously and ignoring potentially profitable trading opportunities. Additionally, the results also pointed to a non-monotonic relationship between the capital ratio and profitability supporting the efficiency risks and franchise-valve hypothesis.

Weakness was that the studies conducted were based on banks panel data of countries most of them in Europe and few in Africa. Also the findings are not consistent on financial performance indicators. Other studies found negative results such as Hoffman (2010) who found negative link between capital ratio and profitability and the studies did not incorporate other variables such as debt to equity ratio which would have been more informative.

Gongera *et al* (2013) investigated loan portfolio management on organization profitability in the Kenyan commercial banks using cross-sectional data. Results of the study revealed that public sector banks and private sector banks were not much affected by increasing or decreasing of interest margin. The study applied cross-sectional data and ordinary least squares estimation method was done. Tabak *et al* (2010) results revealed that loan portfolio concentration increases returns and also reduces default risk; there were significant size effects; foreign and public banks seem to be less affected by the degree of diversification. In the study regression was estimated using both FGLS estimation and the System GMM estimation methods of data panels.

Lingaraja *et al* (2015 study revealed that in the Asian emerging markets especially china, Indian, Malaysia, Taiwan, Indonesia and Thailand these are good opportunities for overseas portfolio diversification and the investors may earn high return. Investors could switch their investments into other different emerging markets in Asia that have sufficiently low correlation to developed markets. Models such as factor analysis principal component and maximum likelihood and correlation matrix were used for estimating the portfolio diversification opportunity and benefits However, from the literature reviewed, studies such as Gonjera *et al* (2013) used cross section data. This study has used panel data which combines time series of cross-section observations, gives more informative data, more variability, less collinearity among the variables and more degree of freedom.

Allen and Rai (1996) estimated a global cost function using an instructional database of financial Institution for fifteen countries. The finding showed that smaller banks in all countries had significant levels of economies of scale on the other hand Italian banks along with French, UK, US ones were found less efficient from the Japanese, Austrian, German, Danish, Swedish and Canadian ones. The study applied stochastic cost frontier approach and the distribution free model. In addition, the system of equations was estimated using Iterative Seemingly Unrelated Regression (SLTR) estimation technique. Weakness arose on the period when the study was conducted and circumstances have changed through the years.

Pastor ,Perez and Quesada (1997) research established that France had the banking system with the highest efficiency level followed by Spain while UK presented the lowest level of efficiency Altunbas and Molyneux (2007) among others in their study on the banking system in France Germany, Italy and Spain found that there was a difference among the market in Europe depending on economics of scale. The study employed a non-parametric approach together with the Malmquist index . Also, Fernandez, Gaskin and Gonzalez (2002) measured the Economic Efficiency of 142 financial intermediates in eighteen countries for period1989-1998. Result showed that commercials banks productivity across the world has grown significantly from 1989 to 1988.The study employed Malmquist productivity index and non-parametric estimation methods (DEA). Weakness arose since the study was conducted on banking firms and not on Microfinance institutions and also the study was done among three geographical areas of North America, Japan and Europe and findings might not be applicable in other countries such as Kenya.

Maudos *et al* (2002) study used multiple regression analysis along with data envelopment analysis techniques and the results suggested that only medium sized banks were profit efficient. Other studies by Lozano- Vivas and pastor (2002) finding showed that banking efficiency was low in European during this time periods .Furthermore the banks in Italy and Netherlands were the only ones which were not able to be operating in a united . The study employed four parametric panel data approaches. This were the Fixed Effect Model (FEM),the Random Effect Model (REM) Stochastic Approach with a panel data (SFA) and the Distribution Free Approach (DFA).However, the study did not incorporate other financial ratio variables and could have

generated more information had it included other variables such as operating expense ratio which could affect financial performance.

Weakness arose from the literature reviewed because of the mixed findings of the previous studies such as Allen and Rai (1996) their results are inconclusive. Their studies showed that smaller banks in all countries had significant levels of economies of scale. Also the existing literature tends to focus more on the banking sector rather than on the microfinance institutions.

1.5 Problem Statement

The introduction of Microfinance Institutions in Kenya is the best alternative source of financial services for low income earners in the rural areas as a means to raise their income, hence reducing their poverty levels. The core principles of microfinance institutions include; access to appropriate financial services among the poor.Microfinancing is based on the premise that the poor has the capability to repay loans, pay the real cost of loans and generate savings, microfinance is an effective tool for poverty alleviation, microfinance institutions must aim to provide financial services to an increasing number of disadvantaged people, microfinance can and should be undertaken on a sustainable basis.

However, studies conducted were based on panel data of countries most of them in Europe and very few in Africa. Also, the studies did not include Microfinance Institution and studies reviewed employed weaker methodologies .In addition, studies did not include Microfinance financial performance variable such as portfolio to assets ratio and the results from the literature reviewed are not consistent on the determinants of bank profitability. Empirical studies conducted results are not consistent thus this remains uncertain and the current study was conducted to bridge the gap by examining the effect of financial indicators namely;debt to equity ratio,portfolio to assets ratio and operating expense ratio on financial performance of MFIs in Kenya.

1.6 Objectives of the study

   The main objective of this study was to investigate the effect of financial indicators on financial performance of Microfinance Institutions in Kenya. The specific objectives were to;
i. Find out the effect of debt to equity ratio on the financial performance of Microfinance Institutions in Kenya.

ii. Examine the effect of portfolio to assets ratio on financial performance of Microfinance Institutions in Kenya.

iii. Examine the effect of operating expense ratio on the financial performance of Microfinance Institutions in Kenya.

1.7 Research Hypotheses

1. H_O :Debt to equity ratio has no affect on the financial performance of Microfinance Institutions in Kenya.

2. H_O :Portfolio to assets ratio has no effect on the financial performance of Microfinance Institutions in Kenya.

3. H_O :Operating expense ratio has no effect on the financial performance of Microfinance Institution in Kenya.

The rejection of the null hypothesis implies that the alternative hypothesis of existence of significant effect for each case is accepted.

1.8 Significance of the Study

The findings from this study will be helpful to the MFIs in making informed decision that would enhance growth and development in Kenya as well as provide the contextual information to researchers and scholars in the area of Microfinance. The study would not only benefit the MFI sector in Kenya but would be of significance to other African developing countries and especially the members of East African Community that are economically similar to Kenya. The study would also benefit investors, decision makers and regulators as well as assist policy makers to set new and improved standards for best practices. Also the study would be a useful tool to academics and other researchers wishing to assess effect of financial ratios of MFIs and provides financial indicators that affect financial performance which can be adopted by MFIs for improved financial performance scores.

In addition, this empirical study which deals with effect of financial ratios on financial performance in Kenya is beneficial for different stakeholders such as MFI managers and executives. Moreover, this study will initiate the Microfinance bank managers and executives to give due emphasis on the management of the identified variables and provide them with understanding of activities that enhance their Microfinance financial performance.

1.9 Scope of the Study

This study concentrated on the effect of financial indicators such as debt to equity ratio, portfolio to assets ratio and operating expense ratio on financial performance of Microfinance institutions in Kenya. The study used secondary sources of panel data of 12 Microfinance Institutions for a period of 5 years (2009-2013) that was collected from Microfinance Information Exchange database (MIX market).

2.0 Theoretical framework

2.0.1 Arbitrary pricing theory

Arbitrary pricing theory was employed to measure microfinance financial performance. The approach has been adopted from the work done by Ross (1976).The Arbitrage Pricing Theory of Ross (1976, 1977) and extensions of that theory constitute an important branch of asset pricing theory and one of the primary alternatives to the capital asset pricing model (CAPM).In a factor model, the random return of each security is a linear combination of a small number of common or pervasive factors, plus an asset specific random variable.

The APT is a substitute for the capital assets pricing model (CAPM) in that both assert a linear relation between assets expected returns and their covariance with other random variables .In the CAPM, the covariance is with the market portfolios return. The covariance is interpreted as a measure of risk that investors cannot avoid by diversification. The slope coefficient in the linear relation between the expected returns and the covariance is interpreted as a risk premium.

Equivalently, the CAPM says that the market portfolios is mean −variance efficient in the investment universe containing all possible assets.Huberman and Kandel (1985), Jobson and Korkie (1982) and Jobson (1982) noted the relation between the APT and mean −variance efficiency. Estimation of the factor loading matrix β entails atleast an implicit identification of the factors. The three approaches listed below have been used to identify the factors .The first consists of an algorithm analysis of the estimated covariance matrix of assets returns. For instance Roll and Ross (1980), Chen (1983) and Lehman and Modest (1988) used factor analysis. The second approach is one in which a researcher starts at the estimated covariance matrix of assets returns and uses his judgment to choose factors and subsequently estimate the matrix β .Huberman and Kandel (1985) noted that the correlations of stock returns of firms of different sizes increases with similarity in size.

Focusing on the assets returns governed by a factor structure, the APT is one period model in which preclusion of arbitrage over static portfolios of these assets leads to a linear relation between the expected return and its covariance with the factors. The arbitrage pricing theory has various practical applications due to its simplicity and flexibility. The three areas of applications include assets allocation, the computation of the cost of capital and the performance evaluation of managed funds. The application of the APT in assets allocation is motivated by the link between the factor structure and mean- variance efficiency. Since the structure with k factors implies the existence of k assets that span the efficient frontier, an investor can construct a mean –variance efficient portfolio with only k assets .The use of the APT in the construction of an optimal portfolio is equivalent to imposing the restriction of the APT in the estimation of the mean and covariance matrix involved in the mean –variance analysis. The APT also has practical applications also in the calculations of the cost of capital ,Elton *et al* (1994) and Bower and Shink (1994) used the APT to derive the cost of capital for electric utilities for the New York state utility commission.

Other attempts to apply the APT model to compute the cost of capital included Bower *et al*(1984) and Goldenberg who used the APT to study the cost of capital for utility shocks and Antonio *et al*(1998) who used the APT to calculate the cost of equity capital when examining the impact of the European exchange rate mechanism. The application of the asset pricing model to the evaluation of money managers was pioneered by Jensen (1968).When the APT to evaluate the money managers, the managed funds returns are regressed on the factors and the intercepts and compared with the returns on benchmark securities such as treasury bills.

The Arbitrage Pricing Model has several weaknesses. According to Fama (1991), one cannot expect any particular asset pricing model to completely describe reality an asset pricing model is a success if it improves our understanding of security market returns. By this standard the APT is a success. Besides, Current statistical methods are not amenable to testing an approximate pricing relation. As a result, tests of the exact multifactor pricing relation are joint tests of the APT and additional assumptions are necessary to obtain exact pricing.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives theoretical literature, review of empirical literature on financial performance of microfinance institutions and the research gaps that are to be filled by the study.

2.1 Theoretical Literature

2.1.1 Arbitrary Pricing Theory

According to Jitka (2003) Arbitrage pricing Theory (APT) also known as Arbitrage pricing model (APM) serves as a generalization of the single factor Capital Assets pricing Model to a multifactor model. The idea behind the APT is that the returns vary from their expected values due to unanticipated changes in production, inflation, term structure and other economic factors. In the multifactor model, it is supposed that the return on an asset is explained in terms of a linear combination of more factors such as debt to equity ratio, portfolio to assets ratio and operating expense ratio. Note that in CAPM, the expected return on an asset is a linear function of the expected market return only. The development of the APT is based on the assumptions of an efficient market. A technical realization of APT uses two popular statistical methods; regression analysis and factor analysis.

According to Ross (1976) Arbitrage pricing theory is a one period model in which every investor believes that the stochastic properties of returns of capital assets are consistent with a factor structure .Ross (1976) argues that if equilibrium prices offer no arbitrage opportunities over static portfolios of the assets, then the expected returns on the assets are approximately linearly related to the factor loadings such as debt to equity ratio, portfolio to assets ratio, and operating expense ratio.

The Arbitrage Pricing Model has several weaknesses. According to Fama (1991), one cannot expect any particular asset pricing model to completely describe reality an asset pricing model is a success if it improves our understanding of security market returns. By this standard the APT is a success. Besides, Current statistical methods are not amenable to testing an approximate

pricing relation. As a result, tests of the exact multifactor pricing relation are joint tests of the APT and additional assumptions are necessary to obtain exact pricing.

The empirical work on identifying the factor structure in security returns and the econometric techniques in this area are insufficiently developed, particularly with respect to incorporating conditioning information. The APT would be a better model if we could relate the factors more closely to identifiable sources of economic risk (Connor, 1992)

2.2 Empirical Literature

This section reviewed empirical literature between debt to equity ratio and financial performance, portfolio to assets ratio and financial performance and operating expense ratio on financial performance.

2.2.1 Debt to equity ratio and financial performance

Panayiotis *et al* (2005) investigated Bank specific industry- specific and macroeconomic determinants of Bank profitability by applying the General method of moments (GMM) techniques to a panel of Greek banks for the period 1985 to 2001. The bank specific profitability determinants were capital, credit risk, productivity, expense management and size, macroeconomic determinants included inflation expectation and cyclical output while the industry-specific determinants comprised of ownership and concentration. The study revealed that bank profitability persists to a moderate extent, indicating that departures from perfectly competitive market structures may not be large. All bank specific determinants, with the exception of size affect bank profitability significantly in the anticipated way. The study on Malaysian banks by Guru *et al* (2004) also showed that efficient management is among the most important factors that explain high bank profitability. In the study, the choice between fixed effect and random effect were estimated using the Hausman specification test. Although the study was conducted on bank profitability determinants, the results are not consistent. In addition, the study was conducted on banks panel data in Europe.

Panayiotis *et al* (2006) examined the determinants of Bank profitability in the south eastern European Region using unbalance panel data –set of south eastern European (SEE) credit institutions over the period 1998-2002. The estimation results indicated that with the exception

of Liquidity all bank – specific determinants significantly affect bank profitability in the anticipated way. A key result is that the effect of concentration is positive which provides evidence in support of the structure conduct performance hypothesis, while at the same time some relevance of the efficient – structure hypothesis cannot be rejected. The study employed linear regression model of estimation as well as the least squares method of fixed effect (FE) and random effect (RE) models. The study adopted a linear regression model and estimation done using Generalized Least Squares (GLS).The variables under study were profitability, liquidity, credit risk, capital, operating expenses management, size, and foreign ownership, market share, banking system reform, inflation and economic activity. The study could have generated more information had it included other variables such as debt to equity ratio which could affect financial performance.

Munyambonera (2012) investigated the determinants of commercial bank performance in sub-saharan Africa (SSA). The study focus was on profitability and total factor productivity as key measures of bank performance. The study used as unbalanced panel data of 216 commercial banks drawn from 42 countries in SSA for the period 1999 to 2006. In estimating bank total factor productively growth the gross accounting procedure, through estimation was by panel random effect methods in static framework. The findings revealed that both bank specific as well as macroeconomic factors explained the variation in commercial bank profitability over the study period. The explanatory variables were growth in bank assets, growth in bank deposits, capital adequancy, operational efficiency, liquidity ratios well as the macroeconomic variables of growth in GDP and inflation. Bank profitability was measured using return on average assets as the dependent variable. The study used larger scope and robust econometric methods in sub-Saharan Africa. This study has also used robust methods and concentrated specifically on Kenya's Microfinance financial performance.

Imad *et al* (2011) investigated the determinants of bank profitability from Jordan using a balanced panel data set of 10 banks over the period 2001 to 2010. Two measures of banks profitability were utilized the rate of return on assets (ROA) and the rate of return on equity (ROE). Results showed that the Jordanian banks characteristics explain a significant part of the variable in bank profitability. High Jordanian banks profitability was associated with well capitalized banks, high lending activities low credit risk and the efficiency of cost management results also showed that the estimated effects of size did not support the significant scale

economies for Jordanian banks. Besides, the estimation results indicated that individual effects on the profitability are present; this was concluded due to the fact that some of the differential slope coefficients were statistically significant. The study findings are not consistent on determinants of bank profitability; in the study we are going to clarify the relationship using MFIs.

Dissanayake (2012) examined the determinants of return on assets from microfinance institutions in Sri lanka. The study was based on 11 Microfinance Institutions in Sri lanka, within the period of 2005-2010. Multiple regression analysis was employed to assess the significant determinants of microfinance profitability. The researcher postulated that operating expense ratio, cost per borrower ratio and debt to equity ratio were statistically significant predictors in determining return on assets ratio. Moreover write off ratio was also another important predictor variable in determining return on assets regardless of the significance. However, the study did not incorporate other variables of financial performance. This research has been expanded by including portfolio to assets ratio.

Gweyi and Karanja (2014) investigated the effect of financial leverage on financial performance of deposit taking Savings and credit Co-operative Societies in Kenya. Sample data was extracted from 40 SACCOs for the period 2010 to 2012.Descriptive and correlation analysis was adopted in the study. Results showed perfect positive correlation between debt to equity ratio with return on equity and profit after tax at 99% confidence interval and a weak positive correlation between debt to equity ratio with return on assets and income growth. However, the weakness of the study arouse from using correlation analysis which determines only association while the current study has used regression analysis which is more robust.

Dimitris *et al* (2013) conducted a study on the determinants of us bank profitability for all the US banks over the period 1984 to 2010 using regression analysis. The results revealed that the competitive process reduces positions of abnormal profitability, ablest this is not immediate. There was also evidence that changes in regulation enacted during the 1990s affected both the level and persistence of bank profitability. The study applied descriptive statistics and sensitivity analysis .However, the study employed methodologies that are weak, this study has incorporated robust methodologies on financial performance in Kenya.

Hoffman (2011) examined the determinant of the profitability of US banks panel data during the period 1995-2007. The empirical analysis combined bank specific and macroeconomic variables through the GMM system estimation. The empirical findings documented a negative link between the capital ratio and profitability, which supported the notion that banks are operating over cautiously and ignoring potentially profitable trading opportunities. Additionally, the results also pointed to a non-monotonic relationship between the capital ratio and profitability supporting the efficiency risks and franchise-valve hypothesis. Generalized Method of Moments estimation method was conducted in the study. The study employed descriptive statistics as well as correlation analysis and estimation done using the ordinary least squares and fixed effect estimation. However, the study was conducted in the US banking Industry and the findings might not be applicable in other countries such as Kenya, this study was done on the Kenyan Microfinance industry using financial ratios.

Muhamad *et al* (2013) conducted a study to compare the determinants of profitability of the domestic and foreign Islamic banks operating in Malaysia. Generalized least square (GLS) method was employed with the unbalanced panel data on 17 Islamic banks, using quarterly data for the period 2007 to 2010. Results revealed that domestic Islamic banks were more profitable than foreign Islamic banks. The results also showed that the profitability determinants of domestic banks are different from those of foreign banks. The overhead expenses, loans, efficiency, gross domestic product growth rate and bank size had a significant effect on determining banks profitability, in which cases applicable to the domestic banks only. In turn, the gross domestic product per capita had a significant effect in determining banks profitability of only the foreign banks. Also, the study found out that deposits, capital and reserves inflation and banks age had a significant effect on determining banks profitability of both domestic and foreign banks. However, the study used quarterly data for a shorter period of four years and this study has utilized annual data with large scope for a period of five years in Kenya.

Sana *et al* (2015) examined the effect of debt financing on firms financial performance measured as return on equity, using panel data of 95 textile companies in Pakistan from 2002-2003 to 2007-2008 using regression analysis. Empirical results showed a non-linear relationship between return on equity and debt to asset ratio. As the debt to assets ratio increased initially, the return on equity also increased until an optimal debt level was reached after that it started decreasing. Also the result revealed that firm's sales growth had positive and significant impact on return on

equity where as the impact. The study was done in Pakistan and countries differ from each other in many respects such as in their economic systems, resources and locality. This study has employed robust methodologies on Microfinance financial performance in Kenya.

Wajid *et al* (2013) investigated impact of capital structure and financial performance on stock returns in the Pakistan Textile industry. The study was estimated using the ordinary least square method and results revealed that debt to equity ratio, return on equity ratio, cash flow ratio, earning per share and time interest earned ratio positively affect stock return. Based on empirical findings, the study concluded that variation in the capital structure and firm performance does affect stock returns of Pakistan Textile Industry. The study variables used were stock returns, debt to equity, return on equity ratio, cash flow ratio, earning per share and time interest earned. However the study failed to incorporate other financial performance indicators such as return on assets.Also, the study employed methodology that was weak, current study has used robust methodology.

Goddard *et al* (2004) examined the profitability of European Banks. A cross-sectional and Dynamic panel analysis in six major European banking sectors; Denmark, France, Germany, Italy, Spain and the UK for the period 1992 to 1998. The results of the empirical analysis suggested that despite the growth in completion in European financial markets there was still significant persistence of profit from one year to the next. The evidence for any consistent or systematic size –profitability is relatively weak. Pooled cross-section time series model was estimated using ordinary least squares and dynamic panel model estimated using Generalized Method of Moments. However, the study was done in Europe and did not include Africa and Kenya in particular. Also the study findings are not consistent with other studies conducted on bank profitability determinants.

2.2.2 Portfolio to assets ratio and financial performance

Muchomba (2012) studied the determinants of commercial banks investment portfolio in Kenya for the period 2007 to 2012. The study used a panel data collected from a sample of 15 banks and the study determinants included rate of return, deposit asset ratio, cash reserve ratio, liquidity by reserve ratio, bank risk, interest rate elasticity, none-performing loans, fee income ratio, bank size and rate of inflation. Hausman test was conducted to assess whether to use the fixed effects estimation or random effect estimation. Also Breusch – pagan LM test of heteroscedasticity was conducted to test if the variance of the residual term was constant over different valves of the explanatory variables. The study revealed that there exists a functional relationship between the commercial banks investment portfolios and the determinants in Kenya context. Also results showed that cash reserve and deposit asset ration have the greatest impact on the investment portfolios. Coefficients of the variables were estimated using Maximum Likelihood Estimation (MLE), regression and correlation analysis was conducted. Weakness arose whereby the study only included Kenyan banks and not Microfinance Institutions in Kenya.

Njeru *et al* (2015) examined the evaluation of financial performance on portfolio holdings held by person funds in Kenya. Using a sample of 35 person funds selected through judgmental sampling. The study utilized secondary data from pension funds and was analyzed using inferential statistics to determine if there was a significant statistical difference in the asset classes. The research findings revealed that discretionary and non-discretionary investment mandates to the fund manager affect the performance of the person funds. The most pertinent concern was lack of trustees to clearly understand and put proper benchmarks to monitor the performance of the funds. The study employed panel data from pension funds administrators. The study used fixed income allocation, equities allocation and offshore allocations as independent variables. The study failed to incorporate other variables of financial performance current study has introduced other variables such as portfolio to assets ratio.

Gongera *et al* (2013) investigated loan portfolio management on organization profitability in the Kenyan commercial banks using cross-sectional data. A descriptive survey research design was employed and sample accessed by the use of both stratified and simple random sampling. Results of the study revealed that public sector banks and private sector banks were not much affected by

increasing or decreasing of interest margin. It could therefore be interpreted that the profitability growth of public and private sector banks were not dependent on fluctuation of interest rate although banks have the benefit of high return due to increase or decrease in interest margin.

The study applied cross-sectional data and ordinary least squares estimation method was done. Diagnostic tests such as autocorrelation and multicollinearity were conducted. However, the study employed weaker methodologies such as ordinary least squares estimation techniques whereas this study has utilized robust methodologies.

Tabak *et al* (2010) in a study on the effects of loan portfolio concentration on Brazilian banks return and risk. The study employed an unbalanced high frequency panel data of 96 commercial banks for the period 2003 to 2009. In the regressions bank returns was dependent variable and feasible generalized least squares (FGLS) and the Generalized Method of Moments (GMM) estimation method was used. The results revealed that loan portfolio concentration increases returns and also reduces default risk; there were significant size effects; foreign and public banks seem to be less affected by the degree of diversification. An important additional results was that there was an increasing concentration trend after the break out of the recent international financial crisis, especially after the failure of Lehman Brothers. In the study regression was estimated using both FGLS estimation and the System GMM estimation methods of data panels. Correlation analysis was conducted in the study and estimation done using FGLS method. However, the results are not consistent on loan portfolio concentration and the study on loan portfolio only involved Brazilian banks and not Microfinance Institutions.

Lingaraja *et al* (2015) examined the Long-run overseas portfolio Diversification benefits and opportunities of Asian Emerging stock markets and developed markets for the period 2005 to 2014.Models such as factor analysis principal component and maximum likelihood and correlation matrix were used for estimating the portfolio diversification opportunity and benefits. The study revealed that in the Asian emerging markets especially china, Indian, Malaysia, Taiwan, Indonesia and Thailand these are good opportunities for overseas portfolio diversification and the investors may earn high return. Investors could switch their investments into other different emerging markets in Asia that have sufficiently low correlation to developed markets. However, the study employed correlation analysis which is a weaker methodology, this study has used robust methodology such as regression analysis.

Al-Tarawneh and Khataybey (2015) investigated portfolio behavior of commercial banks; the expected utility approach in Jordan using monthly services data for the period 2002 to 2009.Empirical results in general did not render any support for the argument that interest rates are an important determinant for the composition of Jordanian bank portfolio and they did not fully explain the behavior such units. The results however showed that availability of funds is more important in determining the structure of these portfolios. The study employed full information maximum likelihood estimation (FIML) method and correlation analysis in their model. However, weakness was the study employing descriptive statistics and correlation analysis which determine only association. While current study has used robust methodologies such as regression analysis.

Bouslama and Ouda (2014) studied international portfolio diversification benefits in equity investing from the perspective of an American investor in the context of a growing market correlation. Equity returns from 41 countries were used including developed emerging and frontier markets during the period from 1988 to 2009.Different investment strategies employing different risk measures including standard variance, GARCH variance, CVAR and LPM (n) were used to assess the robustness of international diversification benefits. Empirical results showed that economic gains from international equity diversification were still substantial despite the growing market correlations. Interestingly international equity diversification allows obvious reduction of returns variability and minimum loss and this is only for restricted portfolios. The study also found that emerging markets continue to be an important component of well-diversified portfolio. However, the research employed descriptive statistics while current study has used robust methodology.

Ekeocha *et al* (2012) investigated the long run determinants of foreign portfolio investment in Nigeria over the period 1981 to 2010.To ensure robustness of the co-integration estimation the study employed both the Engle-Granger approach and the Johansen maximum likelihood procedure. The study applied time series analysis specifically the finite distributed lag model and results revealed foreign portfolio investment had a positive long-run relationship with market capitalization and trade openness in Nigeria.Multiple regression analysis of Vector Error Correction Model as well as the as the maximum likelihood estimation method was adopted in the study. However, the study used time series data, panel data will be employed in the current study on MFIs financial performance. Panel data is the most suitable tool when the sample

comprises cross-sectional and time series data. Also the use of panel data has advantages in the estimation namely; better identification and measure of those effects which are not observable either in cross-sectional or time series analysis

Ndong (2015) examined the effect of portfolio equity investment flows on equity returns and economic growth in 11 major Africa stock markets. The data panel of 11 Africa countries hosting major stock returns were estimated using least squares method (LS), Two stage least squares (2 SLS), Three stage least squares (3 SLS) and least squares Dummy (LSDV) method over the period 1990-2013. Results indicated that the stock market size is a positive determinant of equity returns there is a simultaneous evolution of equity returns and economic growth; net portfolio equity investment have a positive but not statistically significant effect on equity returns and economic growth. Housman specification test and regression analysis was employed in the study. However, the results were not consistent on portfolio equity investment flows on returns.

Rizeanu and Zhang (2013) conducted a study on Exchange rate and portfolio rebalancing in emerging economies. The study tested the portfolio rebalancing model of Hau and Rey (2006) based on a sample of 23 emerging economies for the period 1994 to 2010.Focussing on Hau and Rey (2006) model, the study tested the correlation between the exchange rate returns and the equity return differentials for emerging US stock markets. Results revealed that exchange rate returns in emerging economies are significantly and positively correlated with excess emerging stock market returns vis-avis the United States indicating the portfolio rebalancing does not characterize the exchange rate movements for emerging economies. Weakness arose whereby the study was conducted on emerging economies including very many countries and the findings might not be applicable in other regions such as Kenya.

2.2.3 Operating expense ratio and financial performance

Bhattacharya *et al* (1997) examined the productive efficiency of 70 Indian commercial banks during the early stages of liberalizing the sector technical efficiency scores were deliver using a non- parametric data envelopment analysis as well as parametric stochastic frontiers models .Result showed that variation in efficiency scores among banks is due to temporal components ownership component and random noise component. Public owned banks were most efficient followed by foreign banks and privately gunned banks. However, the results are not consistent on changes in productivity growth.

Allen and Rai (1996) estimated a global cost function using an instructional database of financial institution for fifteen countries. The sample was divided into two group sample was divided in to two groups according to the countries regulatory environment universal banking countries (Australia, Austria, Canada ,Switzerland, Germany ,Denmark, Spain, Finland, France ,Italy, United kingdom and Sweden) permitted the functional integration of commercial and investments banking while separated banking countries (Belgium, Japan and US) did not. Large bank in separated banking countries exhibit the largest measure of input inefficient and had anti-economies of scale .All other banks had significantly lower inefficiency measures .The finding showed that smaller banks in all countries had significant levels of economics of scale on the other hand Italian banks along with French, UK, US ones were found less efficient from the Japanese, Austrian, German, Danish, Swedish and Canadian ones. The study applied stochastic cost frontier approach and the distribution free model. In addition, the system of equations was estimated using Iterative Seemingly Unrelated Regression (SLTR) estimation technique. Weakness arose on the period when the study was conducted and the circumstances have changed through the years.

Pastor ,Perez and Quesada (1997) analyzed the productivity efficiency and difference in technology in the banking system of united states Spain Germany of United states Spain Germany Italy Austral united Kingdom France and Belgium for the year 1992 .Using the non parametric data envelop analysis together with the Malmquist index compared the efficiently and difference in technology of several banking systems .Their study used valued added technically to measure bank sufficiency .Deposits productively asset and loans nominal valves were selected as measured of banking output under the assumption that these are proposal to the number of the

transaction and the flow of services to customers on both sides of the balance sheets. Similarly personal expenses non- interest expenses other than personal expenses were employed as a measurement of inking input. The researcher established that France had the banking system with the highest efficiency level followed by Spain while UK presented the lowest level of efficiency Altunbas and Molyneux (2007) among others in their study on the banking system in France Germany, Italy and Spain found that there was a difference among the market in Europe depending on economics of scale. However, the study was conducted on the banking system of United States, Spain, Germany, Italy, Austria, France and Belgium and countries differ from each other in many respects. This study has concentrated on Microfinance institutions in Kenya.

Fernandez, Gaskin and Gonzalez (2002) measured the Economic Efficiency of 142 financial intermediates in eighteen countries for period1989-1998 .The aim of the study was to establish the relationship between efficiency productivity change and share holders wealth maximization .The researcher applied data envelope analysis to estimated the relative efficiency of commercials bank of different geographical areas (North America, Japan and Europe) The European banks include those from Austria, Belgium, Denmark, Finland ,Germany ,Ireland, Italy, Luxemburg Norway ,Portugal Spain, Sweden, Switzerland and the United Kingdom .The three preferred outputs were total investments total loans and non-interest income plus other operating income .The three prefer outputs were total investments total loans and non-interest income plus other operating income. In parallel the four inputs variables were property salaries other operating expenses and total deposits .Result showed that commercials banks productivity across the world has grown significantly from 1989 to 1988.The study employed Malmquist productivity index and non-parametric estimation methods (DEA).Weakness was that the study was conducted among three geographical areas of North America, Japan and Europe. Current study is based in Africa and Kenya in particular. Also the study was on banking firms and not microfinance institutions

Maudos *et al* (2002) Analyzed the cost and profit efficiency of Europeans banks in ten countries including those from Italy for the periods 1993 to 1996 .The study used multiple regression analysis along with data envelop analysis techniques .The sample was split into large medium and small banks .Result suggested that only medium sized banks were profit efficient other studies by Lozano vitas and pastors (2002) examined banking efficiency in ten European

countries in 1993 the value added methods was adopted and the macroeconomics factors were components of the explanatory variables .The finding showed that banking efficiency was low in European during this time periods .Furthermore the banks in Italy and Netherlands were the only ones which were not able to operating in a united .Europeans banking system compared to the moist efficient bank of the other sample countries. The study employed four parametric panel data approaches. This were the Fixed Effect Model (FEM),the Random Effect Model (REM) Stochastic Approach with a panel data (SFA) and the Distribution Free Approach (DFA). The study employed Distribution Free Approach as well as the correlation analysis. The variables under study were loans, other earnings assets, loanable funds, price of loanable funds, price of labour and price of physical capital. The study could have generated more information had it included other variables such as operating expense ratio which could affect financial performance.

Casu and Molyneux (2003) applied Data Envelop Analysis to investigate whether the productivity efficiency of Europeans banking systems has improved   in the average efficacious scores over the periods Rime and stash (2003) examined the performance of Swiss whether the productivity efficiency of European banking systems has improved ad coverage towards a common Europeans front between 1993 and 1997 .The geographical coverage of the study was France, Germany, Italy ,Spain and the United Kingdom all data was reported in the ECU as the reference currency. Result indicated relatively low average efficiency levels .Nevertheless it was possible to detect slightly improvement in the average efficiency scores over the period of analysis for almost all banking systems in the sample with the exception of Italy. The study employed a non- parametric approach in the form of data envelopment analysis (DEA) and Tobit regression analysis. However, the findings are not consistent on efficiency in European banking. The results are mixed and inconclusive and thus they might not be applicable in other countries such as Kenya.

Rime and Stiroh (2003) examined the performance of Swiss banks for the periods 1996-1999 using Malmquist index of total factors productivity and found evidence of economics of scale for small and mediums size banks .Akhter (2002) estimated the efficiency of 40 commercials banks in Pakistan for the years 1998 through data envelop analysis technique (Berger & Humphrey 1997) the private banks were discovered to be more efficient than the public and the foreign

banks. The study applied parametric approach with a translog specification throughout the analysis. The variables under study were return on assets, return on equity, distance to default, total assets, gross income, traditional share, specialization, credit risk and excess capital. The study could have generated more information had it included other variables such as operating expense ratio which could affect financial performance.

Using Data envelop analysis Rizvi (2001) investigated the productivity of banking sectors in Pakistan for the periods 1993 to 1998 by decomposing total factors productivity in to its constituent components .The study discovered that productivity growth as well as efficiently improved was sluggish during the periods of reforms covered by this performance slightly better than the foreign banks on the other hand roger banks on the other hand common features of us commercials banks for the years 1993 by Malmquist index and found that banks that were large had smaller net interest margins had relatively fever cost deposited and exhibited less risk. The study applied non-parametric approach together with the Malmquist index.However, the study on efficiency and productivity of the banking sector was done in Pakistan and not in Africa and countries differ in many respects. Current study has been conducted in Africa and Kenya in particular.

Das *et al* (2004) explored the effects of financial deregulation on risk and productivity growth of public sector banks in India for the period 1995 to 2001.They found evidence that capital, non-performing loans and productivity are related and do reinforce and complement each other in measuring bank efficiency. Also that higher capital increases productivity, whilst higher loan growth reduces productivity. The study was estimated empirically using the non-parametric approach, Data Envelopment Analysis. Weakness of this study is that the conclusions were based on data for Indian banks. Thus they might not be applicable in other countries such as Kenya due to differences in levels of economic development and macroeconomic environment.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was used in the study. The chapter outlines research design, target population, model specification, data collection, data analysis.

3.2 Research Design

According to Oso and Onen (2011) research design describes the pattern that the research intends to follow, the plan or the strategy for conducting the research. The study was conducted using correlation research design based on the panel data. Correlation research is basically concerned with assessing relationships among variables .It is based on the premise that if a statistically significant relationship exists between two variables, then it is possible to predict one variable using the information available on another variable (Mugenda, 2008). The study analyzed the determinants of financial performance of Microfinance Institutions in Kenya using variables: debt to equity ratio, portfolio to assets ratio, operating expense ratio and return on assets.

3.3 Population

According to Cooper and Schindler (2003) a population refers to an entire group of individuals, events or objects having a common observable characteristics .The target population of study comprised of 12 registered Microfinance Institutions in Kenya for secondary data that was collected for a period of 5 years with 60 observations. Purposive sampling method was used in getting the information. This sampling method is based on the judgment of a researcher regarding the characteristics of the sample. The strategy is to select units that are judged to be typically of the population under investigation. The study sampled Microfinance institutions in Kenya that have been registered by the Association of Microfinance Institution in Kenya (AMFI).

3.4 Sample Size

The sample size in this study consisted of a panel data set of 12 Microfinance Institutions in Kenya for the period of 5 years from 2009 to 2013 a total of 60 observations. The study employed purposive sampling in selecting 12 MFIs from 42 Microfinance Institutions. This study period was chosen because annual MFI data for 5 years was available. Financial performance determinants variables included debt to equity ratio, portfolio to assets ratio, operating expense ratio on return on assets.

3.5 Study Area

The study was be undertaken within the Republic of Kenya, a sovereign state in East Africa with her capital city being Nairobi. The country borders Indian Ocean to the south-east, Tanzania to the south, Uganda to the west, South Sudan to the north-west, Ethiopia to the north and Somali to the north-east. Kenya covers 581,309 km^2 (224,445 sq mi) and has a population of about 44 million in July 2012.Kenya is located approximately between latitudes $5^0\,N$ and $4^0\,40^{'}$ and extends from longitude $33^0\,53^{'}$ East of Greenwich Meridian to $41^0\,55.5^{'}$ East.

Kenya's geographic position makes it major gateway for trade to the Eastern and Central Africa region (Kituyi *et al*., 2005). The economy of Kenya is comparatively the largest by GDP in East and Central Africa and Agriculture and the service industry are the major economic drivers. Economically, Kenya has posted tremendous growth in the service sector, boosted by rapid expansion in telecommunication and financial activity over the last decade, and now contributes 62% of GDP. Unfortunately, a massive 22% of GDP still comes from the unreliable agricultural sector which employs 75% of the labor force (a consistent characteristic of under-developed economies that have not attained food security – an important catalyst of economic growth) and a significant portion of the population (3.75 million) regularly starves and is heavily dependent on food aid, OCHA (2011). Industry and manufacturing is the smallest sector that accounts for 16% of the GDP.

3.6 Model Specification

The model is specified to examine the effect of financial indicators on financial performance of Microfinance Institutions in Kenya. It is a multiple regression model whereby determinants of financial performance are the independent variables and dependent variable is the Return on Assets. Thus we have the multiple regression model of the firm derived and estimated as follows.

$$ROA_{it} = \beta_o + \beta_1\ DE_{it} + \beta_2\ PA_{it} + \beta_3\ OE_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots.. (3.1)$$

Model I: Autoregressive Model

From model 3.1 the following models of estimation are considered incorporating the autoregressive framework to capture potential lag effect of ROA of the previous period having effect on the current ROA.The general model I estimates the effect of lag ROA, current period debt-to-equity ratio, portfolio to asset ratio and operating expense ratio on current ROA represented by equation 3.2.This autoregressive model was used in the basis of policy formulation.

$$ROA_{it} = \beta_o + \beta_1\ ROA_{it-1} + \beta_2\ DE_{it} + \beta_3\ PA_{it} + \beta_4\ OE_{it} + \varepsilon_{it} \ldots\ldots\ldots (3.2)$$

Model II: Autoregressive Distributed Lag Model

The second category of models are specific model which specifies the individual financial indicators against the ROA. The equations are 3.3, 3.4 and 3.5.

(i). Debt to equity ratio on Microfinance Institution

$$ROA_{it} = \alpha_0 + \alpha_1\ DE_{it} + \alpha_2\ DE_{it-1} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (3.3)$$

(ii).Portfolio to assets ratio on Microfinance Institution

$$ROA_{it} = \delta_0 + \delta_1\ PA_{it} + \delta_2\ PA_{it-1} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (3.4)$$

(iii).Operating expense ratio on Microfinance Institution

$$ROA_{it} = \gamma_0 + \gamma_1\ OE_{it} + \gamma_2\ OE_{it-1} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots (3.5)$$

ROA_{it} = Return on Assets DE_{it} = Debt to Equity ratio

PA_{it} = Portfolio to Assets ratio OE_{it} =Operating Expense Ratio

i=…n, where n is the number of firms. β_0=constant/the intercept point of the regression line and the Y-axis. β =is the slope /gradient of the regression line. ε =is the error term.

The expected signs $\beta_1 \geq 0, \beta_2 \geq 0, \beta_3 \geq 0$

3.7 Measurement of Variables

The table below illustrates definitions and measurement of the operational variables that will be used in the study.

Table 3.1 Definition and Measurement of variables

Variables	Variables Indicators	Measurement Levels	Measurement
Performance	Return on Assets	Ratio	Net Income/Average Assets
Determinants of Financial Performance	Debt to Equity Ratio	Ratio	Total Liability/Total Equity
	Portfolio to Assets Ratio	Ratio	Gross Loan Portfolio/Total Assets
	Operating Expense Ratio	Ratio	Operating Expenses/Average Gross Portfolio

3.8 Diagnostic Tests

Diagnostic tests are usually used as a means of indicating model inadequacy or failure. For example in the case of a linear regression model which is estimated by OLS a series of diagnostic tests could be used to indicate whether any of the assumptions required for OLS to be the best linear unbiased estimation (BLUE) appear to be violated. These assumptions include serially uncorrelated and homoscedastic error term, absence of correlation between the error term and the regressions and correct specification of the model. Diagnostic tests play an important role in the model evaluation stage of econometric studies. (Otto, 1994)

3.8.1 Heteroscedasticity Test

Homoskedasticity is one of the assumptions of the classical linear regression model which states that the variance of the errors must be constant. If the errors do not have a constant variance, they are said to be heteroskedasticity (Brooks, 2008).Wooldridge (1999) noted that homoskedasticity fails whenever the variance of the unobservable changes across different segments of the population, which are determined by the different values of the explanatory variables. Thus heteroskedasticity refers to a situation where the disturbance variance is no longer constant. They tend to occur where there is a large variation in the size of the independent variable. Breausch-Pagan LM test of heteroscedasticity was conducted to test if the variance of the residual term will be constant over different values of the explanatory variables. The LM test helps to decide between random effects estimation and simple OLS estimation. The null hypothesis in the LM test is that variance across entities is zero. According to Torres-Reyna (2010), there is no significant difference a cross units and hence, these is no panel effect.

3.8.2 Hausman Test

This tests the efficiency and consistency between the fixed effect and random affect estimations. Although the econometric theory recommends random effect estimation for unbalanced panels, a confirmatory test by use of the Hausman specification test is usually carried out to evaluate the efficiency between fixed effect and random effect estimation methods. A rejection of the null hypothesis is when $\text{Prob} > Ch_2 = \alpha$ confirms the efficiency and consistency of the random effect in estimating the model, Munyambonera (2012).

The Hausman specification is a chi-square test with k-1 degree of freedom, where k=number of regressors. The null hypothesis is that the difference in coefficients is not systematic (i.e random effects), against an alternative of systematic difference in coefficients (i.e. case of fixed effects), if the calculated x^2 is greater than the critical value at a certain significance level, then the null for a fixed effects model is rejected. This implies that there are differences across the cross the cross-sectional units that need to be captured.

The Hausman specification test was conducted to decide whether the fixed or random effects model should be used. This test was mainly based on the consistency and efficiency of random and fixed effects estimators depending on the correlation between the individual effects and fixed the regressors. The test sought to determine whether there was significant correlation

between the unobserved person specific random effects and the regressors. Absence of such correlation would imply that the random effects model would be more powerful and parsimonious. If there was such a correlation, then random effects model would be inconsistence estimated and the fixed effects model would be the model of choice.

The null hypothesis was that there was no such correlation. If there was no statistically significant difference between the covariance matrices of the two models, then the correlations of the random effects with the regressors would be adjudged to be statistically insignificant.

Table 3.2 Hausman specification test results on the financial Indicators

Coefficients				
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fe	Re	Difference	S.E.
llroa	.0691465	.4733858	-.4042392	.1240889
par	.0067674	.0090436	-.0022762	.016294
der	.000582	-.0026717	.0032538	.0051747
oer	-.1793176	-.1857857	.0064681	.097838
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)				
= 13.55				
Prob>chi2 = 0.0089				

Source: Research data

In the table 3.2 the computed chi-square value at 4 degrees of freedom was 13.55 which is more than the p-value at 0.0089 which is less than 5 % level of significance. This indicates that there was correlation between the unique errors (u_i) and the regressors.Hence the null hypothesis was

rejected and fixed effect estimation was favoured against random effect estimations. However the fixed effect model was not a good model thus the study chose the random effect model which gave good results.

3.9 Data Collection

Data collection is the process of gathering and measuring information on variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypothesis and evaluate outcomes. Kumar (1996) notes that information about a situation, person, problem or phenomenon maybe collected from primary source (primary data) or extracted from a secondary source (secondary data). The data obtained was be quantitative in nature.

Panel Data was collected from the MIX market website which is known as Microfinance Information Exchange (MIX).Data from the mix market are reliable and has been used by many researchers who are interested in the Microfinance field, Dissanayake (2012).Further, the MIX market review data of MFIs for coherence and consistence and reclassify according to international financial norms .More specifically the study heavily depended on the data from the mix market database. In addition, the study used secondary sources of data obtained from financial statements of the MFIs which included the statements of financial position, Income statement and Cash flow statements.

4.0 Data Analysis

Inferential statistics such as mean and standard deviation was used to summarize the data. Several significant tests was applied to the variables and model under study to see the significance of the variables and fitness of the overall model. Multiple regression analysis was carried out to determine the strength of the variable. Coefficient of determination was applied on the selected sample to determine the extent to which changes in the ROA can be explained by the change in the independent variables. In the study the methodologies used to estimate the data included descriptive statistics, correlation analysis, Fixed effect model and Random effect models. Fixed effect model was employed in the study because it allows for heterogeneity or individuality among the 12 microfinance institutions by allowing having its own intercept value. The term fixed effect is due to the fact that although the intercept may differ across the microfinance institutions, but the intercept does not vary over time, that is   they are time

invariant. While for random effect model the 12 microfinance institutions have a common mean value for the intercept. Also pair wise correlation analysis was employed in the study to explore pair wise relationships between the variables and descriptive statistics was used to display the characteristics of the sample giving in-depth description of the variables, the mean, standard deviation, minimum and maximum values.

CHAPTER FOUR:

RESULTS AND DISCUSSION

4.1 Introduction

This chapter summarizes results and discussion which includes summary of the variables, presentation, interpretation and discussion of the correlation analysis, descriptive statistics and regression results.

4.2 Descriptive Statistics

This section presents the descriptive statistics of the financial indicators of the Microfinance Institutions in Kenya.

Table 4.1 Descriptive statistics of financial ratios variables

	ROA	DER	PAR	OER
Mean	-1.742553	5.974721	50.35820	37.39356
Median	0.900000	3.350000	51.20500	29.46000
Maximum	7.290000	116.0100	103.0200	222.4000
Minimum	-21.56000	-13.23000	1.670000	11.80000
Std. Dev.	7.932501	18.20089	20.82976	32.96941
Skewness	-1.136218	4.955000	0.077665	4.152679
Kurtosis	3.417986	29.71987	2.559010	23.37151
Jarque-Bera	10.45492	1624.319	0.455416	907.4574
Probability	0.005367	0.000000	0.796357	0.000000
Sum	-81.90000	286.7866	2517.910	1682.710
Sum Sq. Dev.	2894.530	15569.80	21260.07	47827.22
Observations	47	48	50	45

Notes; ROA is return to assets ratio, DER is debt to equity ratio, PAR is

Portfolio to assets ratio and OER is operating expense ratio.

Source: Research   Data

Table 4.1 shows the descriptive statistics of financial indicator variables. ROA measured by the net income divided by total asset has a mean value of -1.742 percent. This indicates that the sample MFIs on averaged earned a net income of -1.742 percent of the total assets. Since ROA

indicates the efficiency of the management of MFIs in generating net income from all the resource from the institutions ,the higher ROA shows that the MFIs is more efficient in using its resources. The maximum value of ROA was 7.29 and minimum value -21.56 .This means that the most profitable microfinance institution among the sampled MFIs earned 7.29 percent of net income for a single US dollars invested in the assets of the firm.In addition, the least profitable microfinance institution of the sampled MFIs incurred -21.56 percent of loss for each US dollars invested in the assets of the firm and this loss may be due to lack of efficiency in expense management or higher operating costs and this eventually causes poor performance of the microfinance institutions and implies that the higher costs of operation negatively affects MFI performance.

Debt to equity ratio which is measured by the total debt divided by total equity has a mean value of 5.97 percent. This implies that the sample MFIs on average earned 5.97 percent total debt of the total equity. The maximum value for debt to equity ratio 116.01 and minimum value is -13.23.The maximum value of 116.01 implies that the microfinance institutions which are heavily trapped in debt have to bear huge interests costs which take a big portion out of the operating incomes of these firms leaving little portion in the net income which will lead to poor performance of the MFIs.

Portfolio to assets ratio which was measured by gross loan portfolio divided by total assets had an average of 50.35 with maximum value of 103.02 and minimum of 1.67 percent respectively. This meant that gross loan portfolio to total assets had a minimum value of 1.67 percent. It can also be deduced that highest level of investment in total assets expressed as a proportion of gross loan portfolio was 103.02 and lowest 1.67 percent of this microfinance institutions.

Another important variable used in the study was the operating expense ratio which was measured by the operating expenses divided by revenue. Operating expense ratio had a mean value of 37.39 percent and with minimum value of 11.8 and maximum value of 222.4 and standard deviation of 32.97.The mean of 37.393 shows that on average the sampled microfinance institutions incurred expenses of 37.393 percent of the total revenue. Also the standard deviation of 32.969 indicates that there was highest variability in operating expense ratio since standard deviation is a measure of dispersion which indicates how the spreads out variable measures are. Thus with maximum value being 222.4 implied that the microfinance institutions incur high

costs of operation and some of them end up performing poorly financially because of higher operating expenses.

The variables seemed not to be normally distributed since their skewness were either more or less than zero. Also, the variables seemed to have a relatively peaked distribution since their kurtosis were positive. All the variables except ROA were positively skewed.

4.3 Correlation Analysis

This section presents the correlation analysis of the financial indicators of the Microfinance Institutions in Kenya.

Table 4.2 Correlation matrix between the financial indicator variables

Covariance Analysis: Ordinary			
Sample: 2009 2013			
Included observations: 44			
Balanced sample (listwise missing value deletion)			
Correlation			
Probability	ROA	DER	PAR	OER
ROA	1.000000			

DER	0.012102	1.000000		
	(0.9379)	-----		
PAR	-0.264413	0.121917	1.000000	
	(0.0828)	(0.4305)	-----	
OER	-0.743926	-0.093522	0.011091	1.000000
	(0.0000)	(0.5460)	(0.9430)	-----

Note: the figures in parenthesis are p-values
ROA is return to assets ratio, DER is debt to equity ratio, PAR is
Portfolio to assets ratio and OER is operating expense ratio.

Source: Research   Data
In the table 4.2, the correlation matrix between the variables is presented. The results supported some level of correlation between returns to assets ratio, debt to equity ratio, portfolio to assets ratio and operating expense ratio. Correlation analysis was used to measure the degree of association between the variables.Overal with the correlation coefficients between the variables

in the range below 0.5, indicated that multicollinearity was not an issue in these estimation as no two variables were highly correlated. Hailer et *al* (2006) supported that multicollinearity problem should only be corrected when the correlation is above 0.8 and 0.9 respectively.

Return on assets ratio correlated negatively with operating expense ratio (-0.7441).This results reveal that a decrease in expenses increases the profit of Microfinance institutions in Kenya. This indicates that the microfinance institutions in Kenya have much to profit if they are able to exercise efficient cost management practices. The results is consistent with the studies of Ghazouani *et al* (2013),Ezra (2013), Dietrich *et al*(2009),Sufian (2011) ,Birhanu (2012) and Amdemikael (2012).

Portfolio to assets ratio had also a negative correlation with return on assets ratio (-0.2644).Whereas debt to equity ratio correlated positively with return on assets ratio (0.0121) and negatively with operating expense ratio (-0.0935). Operating expense ratio also correlated positively with portfolio to assets ratio (0.0111).In addition, debt to equity ratio was positively correlated with portfolio to assets ratio (0.0647)

In addition, debt to equity ratio and portfolio to assets ratio had statistically insignificant correlation with return on assets ratio. By contrast, operating expense ratio had significant correlation with return on assets ratio. Debt to equity ratio had probability value of 0.9379; portfolio to assets ratio 0.0828 and operating expense ratio 0.0000.Most of the correlations were not statistically significant indicating that multicollinearity was not likely to be a problem in the data.

4.4 Diagnostic Test Results

4.4.1 Hausman Specification Test

The decision on whether to use fixed or random effects model was reached through Hausman test where the null hypothesis was that, the preferred model was random effects versus the alternative fixed effects. The test was carried to determine whether or not the unique errors (u_i) were correlated with the regressors.The null hypothesis was that there was no correlation between the unique errors(u_i) and the regressors.The Hausman test tested the efficiency and consistency between the fixed effects and random effect estimators. In this test, a rejection of the

null hypothesis is when $prob \geq chi^2$, confirms the efficiency and consistency of the random effect in estimating the model.

Table 4.5 Hausman specification test results on the financial ratio

| | Coefficients | | | |
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fe	Re	Difference	S.E.
Llroa	.0691465	.4733858	-.4042392	.1240889
Par	.0067674	.0090436	-.0022762	.016294
Der	.000582	-.0026717	.0032538	.0051747
Oer	-.1793176	-.1857857	.0064681	.097838
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)				
= 13.55				
Prob>chi2 = 0.0089				

Source: Research data

In the table 4.5 the computed chi-square value at 4 degrees of freedom was 13.55 which is more than the p-value at 0.0089 which is less than 5 % level of significance. This indicates that there was correlation between the unique errors (u_i) and the regressors. Although according to the Hausman specification test fixed effect model would be the preferred model of choice. However, fixed effect model gives insignificant values. This study has chosen random effect model as the preferred model since it's a good model and gives better results.

4.5 Fixed Effect Model

Table 4.3 Financial indicators fixed effect (within) regression estimations results Autoregressive Model

Fixed-effects (within) regression				Number of obs = 30		
Group variable: id				Number of groups = 11		
R-sq: within = 0.2724				Obs per group: min = 1		
Between = 0.9293				avg = 2.7		
Overall = 0.8617				max = 4		
$F(4,15)$ = 1.40						
corr(u_i, Xb) = 0.7965				Prob> F = 0.2802		
roa	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
Llroa	.0691465	.1658569	0.42	0.683	-.2843691	.4226622
Par	.0067674	.0276745	0.24	0.810	-.0522194	.0657542
Der	.000582	.018163	0.03	0.975	-.0381316	.0392956
Oer	-.1793176	.1099704	-1.63	0.124	-.413714	.0550788
_cons	4.770211	3.953296	1.21	0.246	-3.656041	13.19646
sigma_u 4.3723914						
sigma_e 1.5211281						
rho .89203668 (fraction of variance due to u_i)						
F test that all u_i=0: F(10, 15) = 2.32 Prob> F = 0.0683						

Source: Research   Data

The fixed effect autoregressive model results as presented in table 4.3. The results show that lagged return to assets ratio had positive but not significant relationship with return to assets ratio in the current period. Debt to equity ratio had a positive relationship with return on assets ratio but the relationship was insignificant. Portfolio to assets ratio had a positive relationship with financial performance but insignificant relationship with return on assets ratio and operating expense ratio had a negative and insignificant relationship with financial performance. The

coefficient for lagged return to assets ratio was 0.691; debt to equity ratio was 0.0005, portfolio to assets ratio 0.0067 and for operating expense ratio was -1.793.

4.6 Random Effect Model

Table 4.4 Financial ratios cross section random effect regression estimations results Autoregressive model

Random-effects GLS regression				Number of obs = 30			
Group variable: id				Number of groups = 11			
R-sq: within = 0.2068				Obs per group: min = 1			
between = 0.9817				avg = 2.7			
overall = 0.9277				max = 4			
				Wald chi2(4) = 250.71			
corr(u_i, X) = 0 (assumed)				Prob> chi2 = 0.0000			
roa	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]		
llroa	.4733858	.1100475	4.30	0.000	.2576965	.689075
par	.0090436	.0223692	0.40	0.686	-.0347993	.0528864
der	-.0026717	.0174103	-0.15	0.878	-.0367953	.0314518
Oer	-.1857857	.0502117	-3.70	0.000	-.2841988	-.0873726
cons	5.259502	2.100239	2.50	0.012	1.143108	9.375895
sigma_u .79788515						
sigma_e 1.5211281						
rho .21577061 (fraction of variance due to u_i)						

Source: Research   Data

The random effect autoregressive model results as presented in table 4.4.The coefficient for lagged return to assets ratio was 0.4733.Debt to equity ratio had a negative relationship with return on assets ratio. However, debt to equity ratio did not have a statistically significant relationship with financial performance,the coefficient for debt to equity ratio was -0.0026. The statistical insignificance implied that debt to equity ratio did not play any role in determining return to assets ratio. Portfolio to assets ratio had a positive relationship with financial performance and the relationship was statistically insignificant, portfolio to assets ratio the coeffcicient was 0.0090.The statistical insignificance implied that portfolio to assets ratio did not play any role in determining financial performance. The coefficient for operating expense ratio was -0.1857. The results showed that operating expenses ratio had a negative relationship with return on assets ratio. The relationship was statistically significant at 5% level. Operating expense ratio had negative and significant relationship with return to assets ratio in the current period.This significant effect of operating expense ratio indicates that operating expense ratio depends on financial performance of MFIs on Kenya.

The results for lagged ROA the coefficient was positive and probability was statistically significant at 5% level. This results indicates that lagged ROA had positive and significant relationship with return on assets in the current period. The lagged return to assets ratio was significant and the coefficient was positive implying that ROA from the previous period was an important determinant of return to assets ratio in the current period. This also indicates that the lagged dependent variable is a driver of the current return to assets ratio.

The main objective of this study was to investigate the effect of financial ratios on financial performance of Microfinance Institutions in Kenya. The study specifically sought to examine the effect of debt to equity ratio on financial performance, examine the effect of portfolio to assets ratio on financial performance and estimate effect of operating expense ratio on financial performance of MFIs in Kenya using panel data for five years from the period 2009 to 2013.
The first objective of the study was to estimate the effect of debt to equity ratio on financial performance. Analysis of data on this objective was based on the null hypothesis that debt to equity ratio has no effect on financial performance of Microfinance Institution in Kenya. Debt to equity ratio had a negative but insignificant relationship with return to assets ratio. The results

are contrary to the results of Disanayake (2012) who postulated that debt to equity ratio is statistically significant predictor variable in determining return on assets ratio. Empirical results showed a non- linear relationship between return on equity and debt to asset ratio. As the debt to assets ratio increases, initially the return on equity increases until an optimum debt level is reached after that it starts decreasing.

Watson and Wilson (2002) define debt capital a capital which a business raises by taking out a loan. Debt capital differs from equity or share capital because subscribers to debt capital do not become part owners of the business, but are merely creditors, and the suppliers of debt capital usually receive a contractually fixed annual percentage return on their loan, known as the coupon rate. Debt may be short term or long term. According to Watson and Wilson (2002) debt capital ranks higher than equity capital for the payment of annual returns. This means that before any dividend as paid to the suppliers of equity interest on debt capital must be paid in full.

Conversely, some studies have shown that debt has a negative effect on firm performance (Fama and French, 2000), for instance are of the view that use of excessive debt creates agency problems among shareholders and creditors and that could result in negative relationship between average and firm performance. From the results the study therefore does not reject the null hypothesis rather accept null hypothesis that states that debt to equity ratio has no effect on financial performance of Microfinance Institution in Kenya.

The second objective of the study was to examine the effect of portfolio to assets ratio on financial performance of MFIs in Kenya. Analysis of data on this objective was based on the null hypothesis that portfolio to assets ratio has no effect on financial performance of Microfinance Institution in Kenya. Portfolio to assets ratio had a positive and statistically insignificant relationship with return to assets ratio. These findings are not consistent with the results of (Ndong, 2015). Tabak *et al* (2010) who found that loan portfolio concentration increases returns and also reduces default risk, these are significant size effects, foreign and public banks seem to have less effect by the degree of diversification. And Njeru *et al* (2015) who supported that there was a strong positive relationship between loan repayment and financial performance of deposit taking SACCO in mount Kenya region as indicated by correlation of 0.786 and p- value of 0.001which was less than the acceptable significance level.

Muchomba (2013) results were also inconsistent with these study findings. The study supported that there exists a functional relationship between the commercial banks investment portfolio and the determinants in the Kenyan context. It also established that cash reserve and deposit assets ratios have the greatest impact on the investment portfolios.

However, this results are supported by the findings of Al- Tarawneh and Khataybey (2015) whose empirical results in general did not provide any support for interest rates which are important in determining the general composition of the portfolio holdings of Jordanian bank. From this results therefore the study does not reject null hypothesis but accept the null hypothesis which states that portfolio to assets ratio has no affect on financial performance of Microfinance Institution in Kenya because portfolio to assets ratio is statistically insignificant and does not affect the financial performance of Microfinance institutions in Kenya.

The third objective of the study was to examine the effect of operating expense ratio on financial performance of Microfinance institution in Kenya. Analysis of data on this objective was based on the null hypothesis that operating expense ratio has no effect on the financial performance of Microfinance Institution in Kenya. Operating expense ratio had a negative and statistically significant relationship with return on assets ratio. The findings support that of Ezra (2009) who found the coefficient of the variable representing operational efficiency was negative and significant. This is consistent with the theory that higher costs of operation negatively affect bank profitability. Operational efficiency indicator is the expense variable and explains how banks could be efficient in resource allocation and utilization including human resource and technological improvements in banking.

Also Abebe (2014) who found that that operating efficiency had a negative effect on bank profitability. Other consistent results are those of Athanasoglou *et al* (2013), Kosmidou *et al* (2008), Yadollahzadeh *et al* (2013), Weersainghe *et al* (2013) and Alkhatib (2012) who found negative relationship between operating cost and Bank performance. The negative effect to growth in bank profitability could be explained by high costs in bank operations. Results are consistent with findings of Disanayake (2012) who postulated that operating expense ratio are statistically significant predictors variable in determining return on assets ratio. And also results of brand et al (2001), Ugurs (2006) in profitability of MFI's from the study findings.

Therefore the study rejects the null hypothesis and accept the alternative hypothesis which states operating expense ratio affects financial performance is accepted by the study because the operating expense ratio is statistically significant and negatively affects the financial performance of Microfinance institutions in Kenya.

4.8 Autoregressive Distributed Lag Models

4.8.1 Debt Equity Ratio on Microfinance Performance

Table 4.6:Fixed effect (within) regression results

Fixed-effects (within) regression				Number of obs	=	33
Group variable: id				Number of groups	=	12
R-sq: within = 0.6055				Obs per group: min =	1	
Between = 0.0006				avg =	2.8	
Overall = 0.0000				max =	4	
F(2,19) = 14.58						
corr(u_i, Xb) = -0.2967				Prob> F	=	0.0001
roa	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
der	.0534118	.0156617	3.41	0.003	.0206315	.0861921
llder	.0799378	.0164983	4.85	0.000	.0454065	.1144692
_cons	-2.66287	.3234821	-8.23	0.000	-3.339926	-1.985815
sigma_u 8.4481251						
sigma_e 1.4628308						
rho	.9708903 (fraction of variance due to u_i)					
F test that all u_i=0: F(11, 19) = 77.44 Prob> F = 0.0000						

Source:Research data

Table 4.6 was the fixed effect model which revealed that debt to equity ratio had positive and statistically significant relationship with return ratio at 5 % level while lagged debt to equity ratio

had positive and statistically significant relationship with return to assets ratio. The coefficient for debt to equity ratio was 0.0534 and lagged debt to equity ratio 0.079.

Table 4.7:Random effect GLS estimation results

Random-effects GLS regression			Number of obs	=	33	
Group variable: id			Number of groups	=	12	
R-sq: within = 0.6054			Obs per group: min =		1	
Between = 0.0006			avg =		2.8	
Overall = 0.0000			max =		4	
			Wald chi2(2)	=	29.53	
corr(u_i, X) = 0 (assumed)			Prob> chi2	=	0.0000	
roa	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]	
der	.0525143	.015408	3.41	0.001	.0223152	.0827133
llder	.0789972	.0162163	4.87	0.000	.0472138	.1107807
_cons	-3.418111	2.494618	-1.37	0.171	-8.307471	1.47125
sigma_u| 8.6832395						
sigma_e| 1.4628308						
rho | .97240244 (fraction of variance due to u_i)						

Source:Research data

Table 4.7 was the random effect model. In this model the random effect model was the preferred model according to the Hausman specification test. The probability was 93.33% which is more than 5% level of significance. This also indicated that there was correlation between the unique errors and the regressors.Results from the random effect indicated that debt to equity ratio had positive and statistically significant relationship with return to assets ratio and results are consistent with the results of Disanayake (2014) who postulated that debt to equity ratio is statistically significant predictor variable in determining return to assets ratio. Lagged debt to equity ratio had positive and statistically significant relationship with return to assets ratio. Coefficient for debt to equity ratio was 0.0525 and lagged debt to equity ratio was 0.0789 which implies that debt to equity ratio in the previous period is a determinant to the current period.

Table 4.8: Hausman Specification results

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fe	Re	Difference	S.E.
der	.0534118	.0525143	.0008975	.0028076
llder	.0799378	.0789972	.0009406	.0030371
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)				
= 0.14				
Prob>chi2 = 0.9333				

Source:Research data

Table 4.9 Test of Heteroscedastcity

| Breusch and Pagan Lagrangian multiplier test for random effects |
| roa[id,t] = Xb + u[id] + e[id,t] |
| Estimated results: |
| Var   sd = sqrt(Var) |
| |

	Var	sd = sqrt(Var)
roa	58.33731	7.637886
e	2.139874	1.462831
u	75.39865	8.68324

| Test: Var(u) = 0 |
| chibar2(01) =   14.69 |
| Prob> chibar2 =   0.0001 |

Source:Research data

Table 4.9 Breusch-Pagan LM test results indicated presence of heteroscedasticity .The probability was 0.001 which is less than 5 % implying that we shall reject the null hypothesis and accept the alternative which states that heteroscedasticity exists in the model.

4.8.2 Portfolio to Asset Ratio on Microfinance Performance

Table 5.0 Fixed effect (within) regression results

Fixed-effects (within) regression				Number of obs = 34		
Group variable: id				Number of groups = 12		
R-sq: within = 0.4655				Obs per group: min = 2		
Between = 0.0214				avg = 2.8		
Overall = 0.0354				max = 4		
F(2,20) = 8.71						
corr(u_i, Xb) = -0.6177			Prob> F = 0.0019			
roa	Coef.	Std. Err.	T	P>|t|	[95% Conf. Interval]	
par	.0182386	.0377548	0.48	0.634	-.0605166	.0969937
llpar	.20117	.0613237	3.28	0.004	.073251	.3290891
_cons	-12.29561	2.456791	-5.00	0.000	-17.42039	-7.170833
sigma_u| 10.655111						
sigma_e| 2.2631146						
rho | .95683476 (fraction of variance due to u_i)						
F test that all u_i=0: F(11, 20) = 36.46 Prob> F = 0.0000						

Source:Research data

Table 5.0 was the fixed effect model which revealed that portfolio to assets ratio had had positive but insignificant relationship with return to assets ratio .While the lagged portfolio to assets ratio had positive and statistically significant relationship with return to assets ratio at 5 % level. The coefficient of portfolio to assets ratio was an important determinant of the current portfolio to assets ratio. This also implies that lagged portfolio to assets ratio has effect on return to assets ratio. The coefficient for portfolio to assets ratio was 0.0182 with probability of 0.634 whereas

lagged portfolio to assets ratio had positive coefficients of 0.2011 and with a probability of 0.004 that was statistically significant at 5 % level.

Table 5.1 Random effect GLS estimation results

Random-effects GLS regression				Number of obs = 34		
Group variable: id				Number of groups = 12		
R-sq: within = 0.4648				Obs per group: min = 2		
Between = 0.0219				avg = 2.8		
Overall = 0.0357				max = 4		
				Wald chi2(2) = 12.98		
corr(u_i, X) = 0 (assumed)			Prob> chi2 = 0.0015			
roa	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]	
par	.0200419	.0387534	0.52	0.605	-.0559133	.0959971
llpar	.1621406	.0593394	2.73	0.006	.0458374	.2784437
_cons	-12.26365	3.783317	-3.24	0.001	-19.67882	-4.848488
sigma_u 9.4552024						
sigma_e 2.2631146						
rho .94581517 (fraction of variance due to u_i)						

Source:Research data

Table 5.1 was the random effect model results which revealed that portfolio to asset ratio had positive had positive and insignificant relationship with return to assets ratio the findings are inconsistent with the results of Muchomba (2013) .Lagged portfolio to assets ratio had positive and significant relationship with return to assets ratio .The insignificant results between portfolio to assets ratio and return to assets ratio implies that portfolio to assets ratio is not a determinant of return to assets ratio. The coefficients for portfolio to asset ratio was 0.200 with probability of 0.605 and lagged portfolio to assets ratio had coefficients of 0.1621 with probability of 0.006 that was significant at 0.6 %.

Table 5.2 Hausman Specification results

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fe	Re	Difference	S.E.
par	.0182386	.0200419	-.0018033	.
llpar	.20117	.1621406	.0390295	.0154735
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 5.99				
Prob>chi2 = 0.0500				
(V_b-V_B is not positive definite)				

Source:Research data

Table 5.2 was the Hausman specification test which indicated that random effect model was the preferred model. Since the probability was 0.0500 which is more than 5 % significant level. Thus we shall not reject the null hypothesis which states that random effect model is the preferred model but rather we shall accept it. Also the chi-square value was more than the probability. This further indicated that there was no correlation between the unique errors (ui) and the regressors.

Table 5.3 Test of Heteroscedastcity

Breusch and Pagan Lagrangian multiplier test for random effects		
roa[id,t] = Xb + u[id] + e[id,t]		
Estimated results:		
Var sd = sqrt(Var)		
roa	67.93271	8.24213
e	5.121688	2.263115
u	89.40085	9.455202
Test: Var(u) = 0		
chibar2(01) = 8.80		
Prob> chibar2 = 0.0015		

Source:research data

The Breusch –Pagan test of heteroscedasticity table 5.3 revealed the presence of random effects. Thus the null hypothesis was that no heteroscedasticity exists and alternative heteroscedasticity exists. The probability was 0.0015 which was less tha 5 % level. which implied that heteroscedasticity exists. Thus the Hausman specification test and the Breusch-pagan test both indicated that random effect model was the preferred model.

4.8.3. Operating expense ratio on financial performance

Table 5.4 Fixed effect (within) Estimation results

Fixed-effects (within) regression				Number of obs = 30		
Group variable: id				Number of groups = 11		
R-sq: within = 0.2683				Obs per group: min = 1		
Between = 0.9208				avg = 2.7		
Overall = 0.8287				max = 4		
F(2,17) = 3.12						
corr(u_i, Xb) = 0.7990				Prob> F = 0.0703		
roa	Coef.	Std. Err.	T	P>|t|	[95% Conf. Interval]	
Oer	-.2163149	.0876106	-2.47	0.024	-.401157	-.0314727
lloer	.0211536	.0587713	0.36	0.723	-.1028429	.1451501
_cons	5.388137	2.880802	1.87	0.079	-.6898239	11.4661
sigma_u 5.2121517						
sigma_e 1.4328562						
rho | .92973632 (fraction of variance due to u_i)						
F test that all u_i=0: F(10, 17) = 8.59			Prob> F = 0.0001			

Source:Research Data

Table 5.4 was the fixed effect model and the results indicated that operating expense ratio had negative and statistically significant relationship with return to assets ratio and results are consistent with results of Munyambonera (2012) who added that negative effect of growth in bank profitability could be explained by high costs in bank operations. Other results that are consistent with study findings are those of Abebe(2014), Alkhatib (2012) and Kosmidou *et al* (2008).The lagged operating expense ratio had positive and insignificant relationship with return to assets ratio .Operating expense ratio had coefficients of -0.2163 and probability of 0.024 while lagged operating expense ratio had coefficients of 0.0211 with probability of 0.723 which was insignificant relationship at 72.3%.The coefficients of the lagged operating expense ratio was negative and the negative sign of the coefficients could be explained by the high costs of the microfinance institutions in the previous period.

Table 5.5 Random effect GLS estimation results

Random-effects GLS regression					Number of obs = 30	
Group variable: id					Number of groups = 11	
R-sq: within = 0.2611					Obs per group: min = 1	
Between = 0.8990					avg = 2.7	
Overall = 0.8208					max = 4	
					Wald chi2(2) = 78.08	
corr(u_i, X) = 0 (assumed)					Prob> chi2 = 0.0000	
roa	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]	
Oer	-.3339128	.0753496	-4.43	0.000	-.4815952	-.1862304
Lloer	-.0048241	.0301196	-0.16	0.873	-.0638574	.0542092
_cons	9.772487	1.76053	5.55	0.000	6.321912	13.22306
sigma_u 2.4693963						
sigma_e 1.4328562						
rho | .74811947 (fraction of variance due to u_i)						

Source:Research data

Table 5.5 was the random effect model and results revealed that operating expense ratio had negative and statistically significant relationship with return to assets ratio whereas lagged operating expense ratio had negative but insignificant relationship with return to assets ratio .The coefficients for operating expense ratio was -0.3339 with probability of 0.000 whereas lagged operating expense ratio had coefficients of -0.0048 and probability of 0.873 .the relationship with return to assets ratio was not significant at 87.3 %.

Table 5.6 Hausman specification test

---- Coefficients ----			
(b) (B) (b-B) sqrt(diag(V_b-V_B))			
	Fe	Re	Difference	S.E.
oer	-.2163149	-.3339128	.117598	.0446996
lloer	.0211536	-.0048241	.0259778	.0504665
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2(2) = (b-B)'[(V_b-V_B)^(-1)](b-B)				
= 6.92				
Prob>chi2 = 0.0314				

Source:Research data

Table 5.6 was the Hausman specification test which showed that fixed effect model was the preferred model .The null hypothesis was that the preferred model was random effect and the alternative fixed model preferred model. The probability was 0.0314nwhich was statistically significant at 5 %.The probability was significant at 0.03 % implying that we shall reject the null hypothesis and accept the alternative. Thus fixed effect model was the preferred model. Also the chi-square test value 6.92 which was more than the probability value at 0.03 % which indicated that there was correlation between the unique errors (ui) and the regressors.

Table 5.7 Test of Heteroscedasticity

Breusch and Pagan Lagrangian multiplier test for random effects			
roa[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
Var		sd = sqrt(Var)	
roa	42.83768	6.54505	
e	2.053077	1.432856	
u	6.097918	2.469396	
Test: Var(u) = 0			
chibar2(01) = 9.23			
Prob> chibar2 = 0.0012			

Source:Research data

Table 5.7 Breusch –Pagan test of heteroscedasticity for return to assets ratio was conducted. The null hypothesis was that no heteroscedasticity existed and alternative heteroscedasticity exists. The chi-square value was 9.23 % greater than the probability value at 0.1%.The probability was 0.1 % which was less than the 5% significant level. This indicated that heteroscedasticity existed.

Table 5.8 Test for Heteroscedasiticity:Autoregressive Model

Test for Serial correlation			
Breusch and Pagan Lagrangian multiplier test for random effects			
roa[id,t] = Xb + u[id] + e[id,t]			
Estimated results:			
Var	sd = sqrt(Var)		
roa	42.83768	6.54505	
e	2.313831	1.521128	
U	.6366207	.7978851	
Test: Var(u) = 0			
chibar2(01) = 0.18			
Prob> chibar2 = 0.3372			

Source:Research data

Table 5.8 was the heteroscedasticity test of autoregressive model. Results of the probability indicated no presence of heteroscedasticity.The null hypothesis was that no heteroscedasticity and alternative heteroscedasticity exists. The probability was 0.3372 which was more than the 5% level of significance. The probability value was 33.72 %.Thus we shall not reject the null hypothesis but rather accept the null which states that no heteroscedasticity exists.The test was carried out using the Breusch-pagan LM test. The Chi-square value at 1 degree of freedom was 0.18 which is less than the p-value at 0.3372.This therefore meant that the variance of the random component was constant at 1% significant level. There was no presence of random effects.

CHAPTER V: SUMMARY, CONCLUSIONS AND

RECOMMENDATIONS

5.1 Introduction
This chapter presents a summary   of the findings on the effect of financial indicators on financial performance of Microfinance institutions in Kenya, conclusions, relevant policy recommendations and areas for further research.

5.2 Summary of Findings
  Return on assets ratio exhibited a negative correlation with operating expense ratio. Results revealed that a decrease in expenses increases the profit of Microfinance institutions in Kenya. This indicates that the Microfinance institutions in Kenya have much to profit if they are able to exercise efficient cost management practices. Debt to equity ratio correlated positively with return on assets ratio and negatively with operating expense ratio whereas portfolio to assets ratio had a negative correlation with return on assets ratio. Operating expense ratio also correlated positively with portfolio to assets ratio. In addition, debt to equity ratio was positively correlated with portfolio to assets ratio.

Fixed effect model would have been the preferred model based on the Hausman specification panel estimation technique but the study chose random effect model since it gives better results. The random effect model results showed that debt to equity ratio had a negative relationship with return on assets ratio but the relationship was statistically insignificant. Portfolio to assets ratio had a positive and insignificant relationship with return on assets ratio. In addition, operating expense ratio had a negative relationship with financial performance (ROA). The relationship was statistically significant with returns on assets ratio.

Debt to equity ratio on financial performance autoregressive distributed lag model random effect model was conducted. In this model the random effect model was the preferred model according to the Hausman specification test. Results from the random effect indicated that debt to equity ratio had positive and statistically significant relationship with return to assets ratio. Lagged debt to equity ratio had positive and statistically significant relationship with return to assets ratio.

Autoregressive distributed lag model was also conducted on portfolio to assets ratio on financial performance and the random effect model results revealed that portfolio to asset ratio had positive and insignificant relationship with return to assets ratio .Lagged portfolio to assets ratio had positive and significant relationship with return to assets ratio .The insignificant results between portfolio to assets ratio and return to assets ratio implies that portfolio to assets ratio is not a determinant of return to assets ratio. Hausman specification test indicated that random effect model was the preferred model. Since the probability was 0.0500 which is more than 5 % significant level. Thus we shall not reject the null hypothesis which states that random effect model is the preferred model but rather we shall accept it.

Autoregressive distributed lag model was conducted on operating expense ratio on financial performance and fixed effect model results indicated that operating expense ratio had negative and statistically significant relationship with return to assets ratio .The lagged operating expense ratio had positive and insignificant relationship with return to assets ratio .The coefficients of the lagged operating expense ratio was negative and the negative sign of the coefficients could be explained by the high costs of the microfinance institutions in the previous period.Hausman specification test which showed that fixed effect model was the preferred model .The null hypothesis was that the preferred model was random effect and the alternative fixed model preferred model. Thus fixed effect model was the preferred model.

5.3 Conclusion

The objective of the study was to examine the effect of financial indicators on financial performance of microfinance institutions in Kenya. The study concentrated on 12 MFIs due to insufficient data available for the panel data of 42 MFIs within a span of five years from 2009-2013.The findings of the study showed a negative correlation between portfolio to assets ratio and return on assets ratio whereas debt to equity ratio correlated positively with return on assets ratio. Operating expense ratio exhibited a negative correlation with returns on assets ratio. The negative coefficient and significant effect of operating expense ratio on financial performance (ROA) shows that decrease in expenses increases the performance of the microfinance institution industry in Kenya. This indicates that the MFIs in Kenya have much to profit if they are able to exercise efficient cost management practices. The negative coefficient (-0.1857) of the operating expense ratio implies that there is a lack of efficiency in expense management in MFIs industry

in Kenya. Thus highly significant and negative coefficient of the OER causes poor performance in Kenyan MFIs.This means that the higher costs of operation negatively affect financial performance of the Microfinance institutions.

In addition, the researcher postulated that operating expense ratio and debt to equity ratio are statistically not significant predictor variables in determining return on assets ratio.Conclusions of this study are contrary to the results of Brand *et al* (2001) and Zeynap (2006) in profitability of MFIs whereas the study findings constitute the results of Modigliani *et al* (1958), Berger *et al* (2006) a study on leverage of MFIs.

5.4 Policy Recommendations

The main aim of MFIs is to provide access to financial empowerment to support self employment and small enterprises .Thus the following recommendations are put forward in order to improve the financial performance of MFIs.Association of Microfinance Institution should conduct audit to ensure that all microfinance institutions maintain a proper balance between debt and equity in order to ensure that proper debt management practices are affected and the right investment decisions are made. This will help in regulating microfinance institutions especially in maintaining proper credit policies and making the right investment decisions.

MFIs should consider the provision of long term loans to their clients thus reducing the frequency of repayment.MFIs should consider setting up offices in the rural areas. The MFIs have not been able to access the rural areas due to poor infrastructure. Hence efforts should be geared towards the improvement of the infrastructure by the government thus providing an enabling environment for the MFIs to operate.

In addition, the study recommends that the regulator (CBK) should put measures in place to monitor and regulate the interest rates on loans and deposits.Microfinance institutions should focus on increasing their loan portfolio as this is clearly another element which contributes to financial performance.MFIs management should also employ competent personel and invest appropriately to ensure its effectiveness.

Microfinance institutions in Kenya should aim at formulating and implementing strategies that are likely to enhance rate of returns from their investment portfolios. They could do this by stepping up their effort in educating their clientele about the loan products and they can in turn invest. This would make loans more attractive and competitive thus widening the interest spreads and a higher rate or return. However, changes in interest rate should be done on the basis of interest rate elasticity.Also, the MFIs should lower their interest rate to a level that would cover its operating expenses and at the same time facilitate the growth of their client business.

The government should tightent up the regulations governing the MFI businesses in Kenya to ensure a complete regulatory framework.This will ensure that licensing of microfinance institutions is done as opposed to the current system where there are different forms of institutions offering microfinance services.

The government should enact a law that requires that all MFIs should belong to the Association of Microfinance institutions.This will promote accountability and make the MFI industry grow stronger in terms of resource mobilization and thus improve the MFIs financial performance.

5.5 Limitations of the study

The study had various limitations which need to be considered by other researchers when carrying out further research .The study only considered the effect of financial ratios on financial performance of Microfinance Institutions in Kenya and period of study was also short.

5.6 Recommendation for Further studies

In the final analysis, this study opens up areas for further research. One would be to investigate the effect of financial indicators on financial performance of the Microfinance Institutions in other countries, regions and continents and add to the existing literature.

Secondly, the study only used a few of the variables such as returns on assets ratio, debt to equity ratio, portfolio to assets ratio and operating expense ratio. Future studies may consider other variables such as return on equity, net interest margin, write off ratio, capital assets ratio and other financial ratios on financial performance of Microfinance Institutions.

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Appendix 1: List of Microfinance Institutions in Kenya

1.Faulu Kenya

2.KWFT

3.SMEP DTM limited

4.Vision Fund

5.BIMAS

6.Opportunity Kenya

7.SUMAC

8.Equity

9.Juhudi Kilimo

10.MCL Kenya

11.MUSONI

12. CENTURY

Source: Association of Microfinance Institution in Kenya (AMFI)

APPENDIX II: RAW DATA   ON MFI PANEL DATA (2009-2013)

MFI	CURRENCY	ID	FISCAL YEAR	ROA %	DER %	PAR %	OER %
FAULU KENYA	USD	1	2009	-0.10	5.6	30.2	30.0
	USD	1	2010	-3.00	7.3	37.6	38.8
	USD	1	2011	0.20	8.2	39.4	32.9
	USD	1	2012	0.70	7.86	39.8	34.6
	USD	1	2013	1.74	14.59	71.31	20.89
KWFT	USD	2	2009	4.30	4.4	30.9	18.7
	USD	2	2010	1.60	10.7	33.9	22
	USD	2	2011	1.50	7.9	32.3	24.5
	USD	2	2012	0.90	8.098	31.7	25.3
	USD	2	2013	1.80	6.51	68.65	28.22
SMEP	USD	3	2009	5.00	3.6	29.1	21.7
	USD	3	2010	0.30	6.8	28.6	22.9
	USD	3	2011	0.90	6.8	31.7	24.1
	USD	3	2012	2.10	7.234	32.1	24.7
	USD	3	2013	3.62			
VISION FUND	USD	4	2009	-9.41	2.48	59.02	50.06
	USD	4	2010	-6.3	2.97	58.64	43.21
	USD	4	2011	-9.25	4.15	47.28	48.04

	USD	4	2012				
	USD	4	2013	-6.0	2.44	55.84	52.45
BIMAS	USD	5	2009	-2.64	1.65	48.33	18.35
	USD	5	2010	3.08	1.39	65.35	29.46
	USD	5	2011	3.04	1.93	74.49	25.33
	USD	5	2012		0.55	63.77	
	USD	5	2013				
OPPORTUNITY	USD	6	2009	-18.14	-6.45	71.55	59.5
	USD	6	2010	-12.48	-13.23	80.64	48.93
	USD	6	2011	-8.81	3.68	68.52	44
	USD	6	2012			61.12	
	USD	6	2013	-3.33			42.48
SUMAC	USD	7	2009	3.30	0.1	48	44.3
	USD	7	2010	5.30	0.1	41.9	32.8
	USD	7	2011	6.00	1.3	37.6	27.3
	USD	7	2012	2.70	1.399	36.4	28.1
	USD	7	2013	3.52			
EQUITY	USD	8	2009	5.23	3.1	17.6	12.6
	USD	8	2010	6.43	3.7	21.1	13.6
	USD	8	2011	6.19	4	22.3	12.9
	USD	8	2012	5.65	4.0056	23.9	11.8

	USD	8	2013	5.53	3.7	66.5	11.9
JUHUDI KILIMO	USD	9	2009		3.66	61.41	
	USD	9	2010	-13.86	6.68	60.25	51.92
	USD	9	2011	-8.01	48.28	61.73	37.37
	USD	9	2012	-4.12	116.01	75.84	30.42
	USD	9	2013	-3.69	-5.27	61.37	30.86
MCL KENYA	USD	10	2009	7.29	1.47	69.93	28.90
	USD	10	2010	7.10	1.60	72.31	19.41
	USD	10	2011	4.26	1.62	71.48	14.71
MUSONI	USD	11	2010		-10.45	103.02	
	USD	11	2011	-7.96	-7.22	88.63	45.45
	USD	11	2012			57.54	
	USD	11	2013	-21.27	0.75	43.74	82.82
CENTURY	USD	12	2011		0.03	1.67	
	USD	12	2012	-21.25	0.26	27.80	222.40
	USD	12	2013	-21.56	0.81	54.08	92.03

Source: www.themixmarket.org

Appendix IV: Map of Kenya