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Arbitrage Pricing Theory Modelling of Microfinance Institutions Financial Performance in Kenya

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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 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.

Keywords: Microfinance, Financial ratios, Financial performance, Kenya.

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. Nevertheless, 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. Theoretical framework

1.2.1 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.

CHAPTER TWO

2.0 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

2.2.1 Debt to equity ratio and 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.

Disanayake (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.

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.

2.2.2 Portfolio to assets ratio and financial performance

Muchomba (2013) 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.
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.

2.2.3 Operating expense ratio and financial performance

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.

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 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.

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

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

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

(ii).Portfolio to assets ratio on Microfinance Institution

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

(iii).Operating expense ratio on Microfinance Institution

$ROA_{it} = \gamma_0 + \gamma_1 OE_{it} + \gamma_2 OE_{it-1} + \varepsilon_{it}$ ……..…. (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 $\beta_1 \geq 0, \beta_2 \geq 0, \beta_3 \geq 0$

3.3 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)

3.3.1 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 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.

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.

CHAPTER FOUR:

4.0 RESULTS AND DISCUSSION

4.1 Diagnostic Test Results

4.1.1 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 4.3 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.

4.2 Fixed Effect Model

Table 4.4 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.

4.3 Random Effect Model Table

4.5 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.

4.4 Autoregressive Distributed Lag Models

4.4.1 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)	
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.

4.4.2 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.

4.4.3. 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 11					Number of groups =	
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 ANDRECOMMENDATIONS

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. 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 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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