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EFFECT OF OPERATING EXPENSE RATIO ON FINANCIAL PERFORMANCE OF MICROFINANCE INSTITUTIONS 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 main objective of the study was to investigate the effect of operating expense ratio on financial performance of MFIs in Kenya. 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. 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. The lagged OER had positive and insignificant relationship with return to assets ratio. 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. 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.**

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

I. 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.

II. LITERATURE REVIEW

2.1 Empirical Literature

2.1.1 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.

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.

2.1.2 Debt to equity ratio and 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.

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.

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.

2.1.3 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.

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.

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.

III. RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was used in the study. The chapter outlines model specification used in the study.

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

Operating expense ratio on Microfinance Institution

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

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 $\beta_1 \geq 0, \beta_2 \geq 0, \beta_3 \geq 0$

4. 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 Diagnostic Test Results

4.2.1 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

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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 4.1: 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 4.1 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.

4.3 Fixed Effect Model

Table 4.2: 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

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The fixed effect autoregressive model results as presented in table 4.2. 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.

4.4 Random Effect Model

Table 4.3: 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 4.3.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 coefficient 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.

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4.5 Operating expense ratio on financial performance An Autoregressive Distributes Lag Model

Table 4.4: 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 4.4 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 4.5 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 4.5 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 4.6: 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 4.6 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 4.7: 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 4.7 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.

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Table 4.8: 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 4.8 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.

The main 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 Munyambonera(2012) 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.

5. 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

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 main objective of the study was to examine the effect of portfolio to assets ratio 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.

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