



**ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF ACCOUNTING AND FINANCE**

**CREDIT RISK MANAGEMENT AND PROFITABILITY IN
ETHIOPIAN MICROFINANCE INSTITUTIONS**

**BY
AMANUEL REGASSA**

**ADDIS ABABA, ETHIOPIA
NOVEMBER, 2015**

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ETHIOPIAN MICROFIANCE INSTITUTIONS**

**A THESIS SUBMITTED TO COLLEGE OF BUSINESS AND
ECONOMICS DEPARTMENT OF ACCOUNTING AND
FINANCE IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF
SCIENCE IN ACCOUNTING AND FINANCE**

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ADDIS ABABA, ETHIOPIA
NOVEMBER, 2015**

Declaration

I declare that the thesis entitled: *Credit risk management and profitability in Ethiopian microfinance institutions*, hereby submitted by me in partial fulfillment of the requirements for the Degree of Master of Science (Accounting and Finance) at the University of Addis Ababa, is my original work and has not been submitted for any degree in any other university. I have undertaken it independently with the advice of my advisor, Degefe Duressa (PhD). In performing the thesis I have used different sources and material which have been acknowledged.

Name: Amanuel Regassa Negewo

Signature _____

November 2015

Certification

This is to certify that Amanuel Regassa Negewo has carried out his research work on the topic entitled **“Credit risk management and profitability in Ethiopian microfinance institutions”**. The work is original in nature and is suitable for the submission for the reward of MSc Degree in Accounting and Finance.

Advisor: Degefe Duressa (PhD): _____

Addis Ababa University
School of Graduate Studies

This is to certify that the thesis prepared by Amanuel Regassa, entitled: *Credit risk management and profitability in Ethiopian microfinance institutions* and submitted in partial fulfillment of the requirements for the Degree of Master of Science (Accounting and Finance) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the Examining Committee:

Examiner: _____ Signature _____ Date _____

Examiner: _____ Signature _____ Date _____

Advisor: Degefe Duressa (PhD) Signature _____ Date _____

Chair of Department or Graduate Program Coordinator

Abstract

Microfinance institutions (MFIs) today are the largest financial institutions around the world. However, they are facing risks when they are operating. Credit risk is one of the most significant risks that microfinance institutions face, considering that granting credit is one of the main sources of income in microfinance institutions. Therefore, the management of the risk related to credit affects the profitability of MFIs. The aim of the research is to provide stakeholders with accurate information regarding the credit risk management of microfinance institutions with its impact on profitability. The main purpose of the research is to investigate if there is a relationship between credit risk management and profitability of microfinance institutions in Ethiopia. In the research model, ROE and ROA are defined as proxies of profitability while PAR>30 days, LLPR, WOR & RC are defined as proxies of credit risk management. The research collects data from 12 microfinance institutions in Ethiopia from 2003 to 2012 and formulates two hypotheses which are related to the research question. A series of statistical tests are performed in order to test if the relationship exists. The findings reveal that credit risk management does have statistically significant effects on profitability of commercial banks. Between the four proxies of credit risk management, LLPR & WOR have a significant effect on the both ROE and ROA while PAR>30 days & RC have an insignificant effect on both ROE and ROA.

Key words: Credit risk management, Profitability, microfinance institutions, PAR>30 days, LLPR, WOR, RC, ROA, ROE.

Acknowledgment

I want to thank and express my great gratitude to all those who helped with the completion of the thesis. First, I am deeply grateful to my advisor Dr. Degefe Duressa, for his constructive comments, valuable suggestions and good guidance. Additionally, I offer my gratitude to my friends and family that supported me through the writing of this research. All of you have contributed to a successful and rewarding writing process.

I would also like to convey my sincere thanks to my family, specially my wife Nardos Mulatu and my daughter Kethara Amanuel for their unconditional love and encouragement throughout my study.

My heartfelt thanks are also extended to Dr. Megersa Abera for his invaluable comments and guidance at various stages of my study.

Last but not least, my special thanks go to my friends for their input and encouragement.

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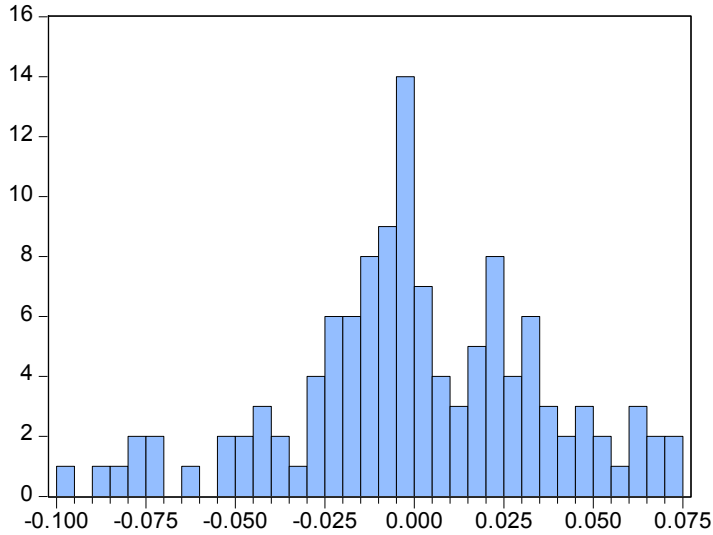
List of acronyms

AEMFI	Association of Ethiopian microfinance institutions
LLPR	Loan loss provision ratios
MFI	Microfinance institutions
OLS	Ordinary Least Square
PAR	Portfolio at risk
P-value	Probability Value
RC	Risk coverage
ROA	Return on asset
ROE	Return on equity
WOR	Write-off ratio

Appendix i

Tests for Normality: Histogram

1. ROA

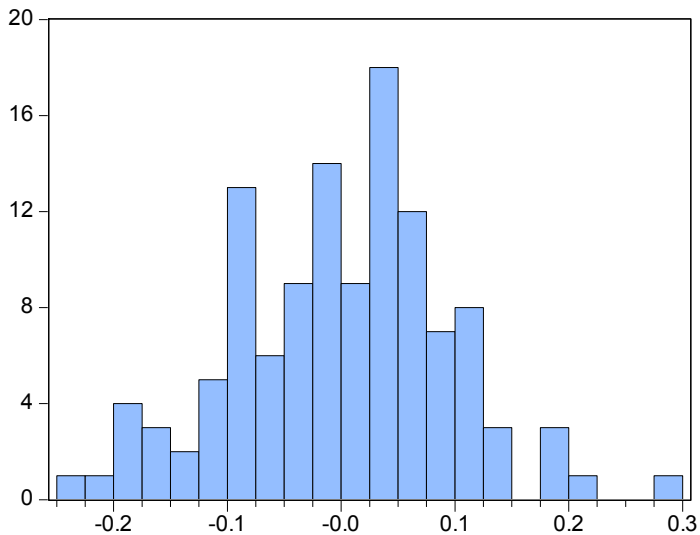


Series: Standardized Residuals
Sample 2003 2012
Observations 120

Mean	5.20e-19
Median	-0.002188
Maximum	0.072711
Minimum	-0.097566
Std. Dev.	0.035257
Skewness	-0.325646
Kurtosis	3.166259

Jarque-Bera	2.259119
Probability	0.323176

2. ROE



Series: Standardized Residuals
Sample 2003 2012
Observations 120

Mean	2.08e-18
Median	0.005543
Maximum	0.276455
Minimum	-0.230810
Std. Dev.	0.094963
Skewness	-0.107312
Kurtosis	3.016246

Jarque-Bera	0.231637
Probability	0.890637

Appendix ii:

Tests for Heteroscedasticity - White Test

Heteroskedasticity Test: White

Dependent Variable: ROE

F-statistic	1.110816	Prob. F(14,105)	0.3572
Obs*R-squared	15.48029	Prob. Chi-Square(14)	0.3461
Scaled explained SS	12.27568	Prob. Chi-Square(14)	0.5842

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 11/09/15 Time: 20:49

Sample: 1 120

Included observations: 120

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009756	0.006458	1.510705	0.1339
PAR	0.103305	0.138198	0.747513	0.4564
PAR^2	-0.006947	0.018624	-0.373	0.7099
PAR*LLPR	0.865226	1.068529	0.809735	0.4199
			-	
PAR*WOR	-1.907851	1.407806	1.355194	0.1783
			-	
PAR*RC	-0.034909	0.219437	0.159084	0.8739
LLPR	0.044835	0.212378	0.21111	0.8332
LLPR^2	0.183771	0.507438	0.362154	0.718
			-	
LLPR*WOR	-1.277507	0.982191	1.300671	0.1962
			-	
LLPR*RC	-0.096905	0.318189	0.304552	0.7613
WOR	0.104669	0.34184	0.306193	0.7601
WOR^2	1.146426	0.704814	1.626567	0.1068
			-	
WOR*RC	-0.092155	0.371288	0.248205	0.8045
RC	-0.007578	0.019506	-0.38851	0.6984
RC^2	0.007151	0.01634	0.437651	0.6625
R-squared	0.129002	Mean dependent var		0.011924
Adjusted R-squared	0.012869	S.D. dependent var		0.015736

S.E. of regression	0.015634	Akaike info criterion	5.362257
Sum squared resid	0.025665	Schwarz criterion	-5.01382
Log likelihood	336.7354	Hannan-Quinn criter.	5.220755
F-statistic	1.110816	Durbin-Watson stat	2.025818
Prob(F-statistic)	0.357205		

Heteroskedasticity Test: White

Dependent Variable: ROA

F-statistic	1.279052	Prob. F(14,105)	0.2327
Obs*R-squared	17.48323	Prob. Chi-Square(14)	0.2313
Scaled explained SS	15.7021	Prob. Chi-Square(14)	0.3319

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 11/09/15 Time: 20:55

Sample: 1 120

Included observations: 120

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002173	0.00141	1.54134	0.1262
PAR	0.035059	0.028143	1.245781	0.2156
PAR^2	-0.004636	0.002773	1.672135	0.0975
PAR*LLPR	-0.056943	0.183184	0.310848	0.7565
PAR*WOR	0.052914	0.126951	0.416809	0.6777
PAR*RC	-0.040395	0.038777	1.041717	0.2999
LLPR	-0.015868	0.024813	0.639516	0.5239
LLPR^2	-0.037719	0.06733	-0.56021	0.5765
LLPR*WOR	-0.031596	0.085116	0.371214	0.7112
LLPR*RC	0.034089	0.040629	0.839031	0.4034
WOR	0.03616	0.03066	1.179396	0.2409
WOR^2	-0.076837	0.06588	1.166316	0.2461

WOR*RC	-0.031321	0.035747	-0.87619	0.3829
RC	-0.005347	0.004072	1.312965	0.1921
RC^2	0.005002	0.003197	1.564411	0.1207
R-squared	0.145694	Mean dependent var		0.00165
Adjusted R-squared	0.031786	S.D. dependent var		0.002318
S.E. of regression	0.00228	Akaike info criterion		-
Sum squared resid	0.000546	Schwarz criterion		-
Log likelihood	567.7492	Hannan-Quinn criter.		9.070985
F-statistic	1.279052	Durbin-Watson stat		1.814996
Prob(F-statistic)	0.232745			

Appendix iii

Regression result

Appendix iii: Regression Result

Dependent Variable: ROE

Method: Panel Least

Squares

Date: 11/09/15 Time: 21:01

Sample: 2003 2012

Periods included: 10

Cross-sections included: 12

Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PAR	-0.006407	0.019164	0.334344	0.7388
LLPR	-1.08537	0.268046	4.049188	0.0001
WOR	-0.7732	0.268781	2.876698	0.0049
RC	-0.048114	0.047017	1.023338	0.3085
C	0.124508	0.029691	4.193476	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.50899	Mean dependent var	0.040118
Adjusted R-squared	0.438172	S.D. dependent var	0.135522
S.E. of regression	0.101581	Akaike info criterion	-1.61236
Sum squared resid	1.073138	Schwarz criterion	-1.2407
Log likelihood	112.7417	Hannan-Quinn criter.	-1.46143
F-statistic	7.187228	Durbin-Watson stat	1.675943
Prob(F-statistic)	0		

Dependent Variable: ROA
 Method: Panel Least
 Squares
 Date: 11/09/15 Time: 21:11
 Sample: 2003 2012
 Periods included: 10
 Cross-sections included: 12
 Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PAR	-0.00414	0.007257	0.667991	0.5695
WOR	-0.23097	0.085907	3.552297	0.0082
LLPR	-0.25464	0.099517	1.564537	0.0031
RC	0.03399	0.01669	0.226962	0.4390
C	0.02786	0.011023	2.527047	0.0130

Effects
Specification

Cross-section fixed (dummy variables)

R-squared	0.411283	Mean dependent var	0.009898
Adjusted R-squared	0.325227	S.D. dependent var	0.045911
S.E. of regression	0.037714	Akaike info criterion	-3.59403
Sum squared resid	0.147921	Schwarz criterion	-3.22236
Log likelihood	231.6416	Hannan-Quinn criter.	-3.44309
F-statistic	4.82371	Durbin-Watson stat	1.333737
Prob(F-statistic)	0.000001		

Appendix iv:

The raw data used for analysis (Source- AEMFI Bulletin)

YEAR	FIRM	ROA	ROE	PAR 30 days	LLPR	WOR	RC
2003	Addis Credit & Savings Institution (AdCSI)	-7.80%	-9.50%	7.80%	5.90%	5.90%	51.2%
2004	Addis Credit & Savings Institution (AdCSI)	-5.90%	-6.80%	20.60%	3.30%	3.30%	27.6%
2005	Addis Credit & Savings Institution (AdCSI)	0.50%	0.70%	0.90%	2.20%	2.20%	70.0%
2006	Addis Credit & Savings Institution (AdCSI)	-6.50%	-9.20%	3.50%	1.50%	1.50%	47.9%
2007	Addis Credit & Savings Institution (AdCSI)	-8.10%	-	0.00%	1.30%	1.30%	0.0%
2008	Addis Credit & Savings Institution (AdCSI)	4.00%	6.00%	3.00%	1.00%	1.00%	23.0%
2009	Addis Credit & Savings Institution (AdCSI)	3.00%	4.00%	4.00%	0.00%	0.00%	53.0%
2010	Addis Credit & Savings Institution (AdCSI)	4.00%	6.00%	4.60%	0.00%	0.00%	34.6%
2011	Addis Credit & Savings Institution (AdCSI)	3.10%	6.30%	3.78%	0.00%	0.00%	53.8%
2012	Addis Credit & Savings Institution (AdCSI)	3.40%	7.80%	2.50%	0.00%	0.00%	54.0%
2003	Africa Village Financial Service (AVFS)	-9.40%	15.20%	11.60%	0.60%	0.60%	31.3%
2004	Africa Village Financial Service (AVFS)	-10.1%	16.40%	2.30%	14.30%	14.30%	87.0%
2005	Africa Village Financial Service (AVFS)	-8.0%	12.70%	3.30%	14.90%	14.90%	84.0%
2006	Africa Village Financial Service (AVFS)	-7.8%	12.80%	4.30%	13.20%	13.20%	65.2%
2007	Africa Village Financial Service (AVFS)	-5.7%	-9.30%	5.40%	4.50%	4.50%	52.9%
2008	Africa Village Financial Service (AVFS)	1.0%	1.00%	10.00%	5.00%	5.00%	51.0%
2009	Africa Village Financial Service (AVFS)	3.0%	3.00%	9.00%	8.00%	8.00%	55.0%
2010	Africa Village Financial Service (AVFS)	-2.0%	-3.00%	3.60%	0.00%	0.00%	21.9%
2011	Africa Village Financial Service (AVFS)	-1.8%	-3.20%	7.39%	7.39%	0.00%	10.8%
2012	Africa Village Financial Service (AVFS)	3.2%	5.80%	9.50%	9.30%	9.50%	13.2%
2003	Amhara Credit & Savings Institution (ACSI)	3.8%	11%	1.70%	2.20%	2.20%	83.3%
2004	Amhara Credit & Savings Institution (ACSI)	4.80%	13.70%	0.50%	1.50%	1.50%	87.0%
2005	Amhara Credit & Savings Institution (ACSI)	4.30%	13.20%	1.10%	1.00%	1.00%	72.0%
2006	Amhara Credit & Savings Institution (ACSI)	4.50%	14.60%	0.80%	1.00%	1.00%	66.5%
2007	Amhara Credit & Savings Institution (ACSI)	4.10%	14.50%	0.50%	0.90%	1.00%	59.2%
2008	Amhara Credit & Savings Institution (ACSI)	8.00%	25.00%	2.00%	0.00%	0.00%	42.0%
2009	Amhara Credit & Savings Institution (ACSI)	6.00%	24.00%	4.00%	0.00%	0.00%	53.0%
2010	Amhara Credit & Savings Institution (ACSI)	4.00%	13.00%	3.50%	0.00%	0.00%	60.4%
2011	Amhara Credit & Savings Institution (ACSI)	6.60%	23.50%	1.46%	-0.77%	0.00%	123.4%
2012	Amhara Credit & Savings Institution (ACSI)	7.10%	25.40%	1.00%	0.00%	0.00%	81.8%
2003	Buussa Gongofa Microfinance Institution (BUUSA)	-4.60%	-5.30%	5.8	5.60%	5.60%	20.5%
2004	Buussa Gongofa Microfinance Institution (BUUSA)	-5.10%	-6.40%	3.90%	2.10%	2.10%	52.4%
2005	Buussa Gongofa Microfinance Institution (BUUSA)	-8.50%	12.10%	0.40%	1.30%	1.30%	49.7%
2006	Buussa Gongofa Microfinance Institution (BUUSA)	-1.30%	-2.00%	1.20%	-0.10%	-0.10%	66.8%
2007	Buussa Gongofa Microfinance Institution (BUUSA)	-0.80%	-1.60%	1.30%	0.50%	0.50%	54.1%
2008	Buussa Gongofa Microfinance Institution (BUUSA)	7.00%	16.00%	2.00%	0.00%	0.00%	70.0%
2009	Buussa Gongofa Microfinance Institution (BUUSA)	7.00%	15.00%	2.00%	1.00%	1.00%	86.0%
2010	Buussa Gongofa Microfinance Institution (BUUSA)	7.00%	15.00%	1.60%	0.00%	0.00%	81.8%
2011	Buussa Gongofa Microfinance Institution (BUUSA)	3.78%	26.80%	0.68%	-0.42%	0.00%	87.6%
2012	Buussa Gongofa Microfinance Institution (BUUSA)	3.78%	49.40%	0.60%	0.00%	0.00%	76.3%
2003	Dedebit Credit & Savings Institution (DECSI)	-0.5%	-1.1%	6.2%	12.4%	12.4%	72.7%
2004	Dedebit Credit & Savings Institution (DECSI)	2.10%	5.50%	2.30%	7.10%	7.10%	0.0%
2005	Dedebit Credit & Savings Institution (DECSI)	3.40%	12.60%	0.00%	0.00%	0.00%	0.0%
2006	Dedebit Credit & Savings Institution (DECSI)	1.90%	8.50%	0.00%	0.00%	0.00%	0.0%

2007	Dedebit Credit & Savings Institution (DECSI)	-0.30%	-1.60%	0.50%	1.80%	1.80%	53.5%
2008	Dedebit Credit & Savings Institution (DECSI)	2.00%	10.00%	2.00%	1.00%	1.00%	24.4%
2009	Dedebit Credit & Savings Institution (DECSI)	3.00%	8.00%	5.00%	0.00%	0.00%	70.0%
2010	Dedebit Credit & Savings Institution (DECSI)	0.00%	0.00%	6.70%	0.00%	0.00%	66.4%
2011	Dedebit Credit & Savings Institution (DECSI)	1.90%	7.80%	2.16%	-0.20%	0.00%	99.7%
2012	Dedebit Credit & Savings Institution (DECSI)	2.50%	10.30%	4.50%	0.00%	0.00%	72.4%
2003	OMO Microfinance Institution (OMO)	-	-	-	-	-	-
2003	OMO Microfinance Institution (OMO)	10.90%	50.80%	11.40%	26.30%	26.30%	71.4%
2004	OMO Microfinance Institution (OMO)	-6.10%	39.50%	5.50%	26.00%	26.00%	83.9%
2005	OMO Microfinance Institution (OMO)	-2.00%	17.90%	1.20%	17.50%	17.50%	76.6%
2006	OMO Microfinance Institution (OMO)	-0.50%	-4.90%	2.90%	10.50%	10.50%	56.8%
2007	OMO Microfinance Institution (OMO)	-1.30%	11.00%	2.00%	5.70%	5.70%	64.1%
2008	OMO Microfinance Institution (OMO)	2.00%	23.00%	5.00%	3.00%	3.00%	58.0%
2009	OMO Microfinance Institution (OMO)	2.00%	17.00%	7.00%	0.00%	0.00%	33.0%
2010	OMO Microfinance Institution (OMO)	0.00%	1.00%	6.60%	0.00%	0.00%	63.4%
2011	OMO Microfinance Institution (OMO)	1.40%	5.90%	15.16%	-0.01%	0.00%	81.0%
2012	OMO Microfinance Institution (OMO)	2.60%	14.40%	9.40%	0.00%	0.00%	81.3%
2003	Oromia Credit & Savings S.C (OCSSCO)	-6.5%	-9.4%	7.8%	0.0%	0.0%	97.8%
2004	Oromia Credit & Savings S.C (OCSSCO)	-0.70%	-1.20%	5.00%	0.00%	0.00%	46.0%
2005	Oromia Credit & Savings S.C (OCSSCO)	1.10%	2.10%	5.30%	0.00%	0.00%	73.0%
2006	Oromia Credit & Savings S.C (OCSSCO)	0.40%	0.90%	0.20%	1.30%	1.30%	43.0%
2007	Oromia Credit & Savings S.C (OCSSCO)	0.70%	2.00%	0.00%	1.80%	1.80%	0.0%
2008	Oromia Credit & Savings S.C (OCSSCO)	4.00%	17.00%	3.00%	1.00%	1.00%	86.0%
2009	Oromia Credit & Savings S.C (OCSSCO)	3.00%	14.00%	7.00%	0.00%	0.00%	33.0%
2010	Oromia Credit & Savings S.C (OCSSCO)	3.00%	14.00%	4.60%	0.00%	0.00%	64.6%
2011	Oromia Credit & Savings S.C (OCSSCO)	5.40%	20.70%	3.52%	-0.71%	0.00%	52.9%
2012	Oromia Credit & Savings S.C (OCSSCO)	6.50%	22.50%	3.20%	0.00%	0.00%	21.3%
2003	Poverty Eradication & community empowerment(PEACE)	-5.30%	12.70%	0.20%	0.00%	0.00%	64.4%
2004	Poverty Eradication & community empowerment(PEACE)	3.4%	7.9%	0.1%	0.0%	0.00%	93.7%
2005	Poverty Eradication & community empowerment(PEACE)	-3.0%	-8.8%	0.1%	0.1%	0.1%	77.2%
2006	Poverty Eradication & community empowerment(PEACE)	5.9%	21.5%	0.7%	0.0%	0.0%	57.0%
2007	Poverty Eradication & community empowerment(PEACE)	5.2%	17.7%	0.5%	0.2%	0.2%	90.1%
2008	Poverty Eradication & community empowerment(PEACE)	7.0%	20.0%	0.0%	0.0%	0.0%	69.0%
2009	Poverty Eradication & community empowerment(PEACE)	2.0%	7.0%	6.0%	0.0%	0.0%	71.0%
2010	Poverty Eradication & community empowerment(PEACE)	7.0%	18.0%	0.4%	0.4%	0.4%	936.8%
2011	Poverty Eradication & community empowerment(PEACE)	9.3%	21.2%	0.3%	0.4%	0.55%	81.8%
2012	Poverty Eradication & community empowerment(PEACE)	6.5%	14.4%	0.1%	-0.6%	0.00%	71.3%
2003	Meklit Microfinance Institution(Meklit)	-6.7%	-14.5%	9.7%	12.5%	12.5%	62.8%
2004	Meklit Microfinance Institution(Meklit)	-8.70%	45.90%	17.70%	14.80%	14.80%	74.8%
2005	Meklit Microfinance Institution(Meklit)	-4.20%	27.00%	7.00%	17.30%	17.30%	76.0%
2006	Meklit Microfinance Institution(Meklit)	7.60%	27.50%	2.90%	6.00%	6.00%	101.8%
2007	Meklit Microfinance Institution(Meklit)	2.40%	7.50%	2.40%	2.80%	2.80%	129.8%
2008	Meklit Microfinance Institution(Meklit)	3.00%	12.00%	4.00%	0.00%	0.00%	166.0%
2009	Meklit Microfinance Institution(Meklit)	0.00%	0.00%	16.00%	0.00%	0.10%	72.0%
2010	Meklit Microfinance Institution(Meklit)	-2.00%	-7.00%	23.80%	5.90%	5.90%	48.1%
2011	Meklit Microfinance Institution(Meklit)	6.50%	23.60%	21.33%	5.51%	7.72%	34.6%
2012	Meklit Microfinance Institution(Meklit)	9.50%	28.30%	10.20%	4.50%	5.90%	26.7%
2003	Specialized Financial & Promotional Institution (SFPI)	-4.00%	-6.80%	0.90%	1.50%	1.50%	122.4%
2004	Specialized Financial & Promotional Institution (SFPI)	-3.30%	-6.50%	1.50%	3.90%	3.90%	58.0%

2005	Specialized Financial & Promotional Institution (SFPI)	-3.40%	-6.50%	4.30%	5.40%	5.40%	59.2%
2006	Specialized Financial & Promotional Institution (SFPI)	-2.70%	-5.10%	3.10%	2.90%	2.90%	57.6%
2007	Specialized Financial & Promotional Institution (SFPI)	-9.30%	-	1.80%	6.10%	6.10%	70.5%
2008	Specialized Financial & Promotional Institution (SFPI)	3.00%	6.00%	4.00%	2.00%	2.00%	72.0%
2009	Specialized Financial & Promotional Institution (SFPI)	1.00%	3.00%	3.00%	5.00%	5.00%	68.0%
2010	Specialized Financial & Promotional Institution (SFPI)	7.00%	15.00%	3.20%	0.00%	0.00%	53.2%
2011	Specialized Financial & Promotional Institution (SFPI)	6.80%	14.70%	5.99%	-2.59%	0.00%	36.2%
2012	Specialized Financial & Promotional Institution (SFPI)	7.60%	17.80%	2.70%	0.00%	0.00%	85.8%
2003	Wisdom Microfinance Institutions (WISDOM)	-3.8%	-10.7%	5.3%	4.5%	6.9%	46.3%
2004	Wisdom Microfinance Institutions (WISDOM)	-2.50%	-4.90%	3.50%	4.50%	5.60%	34.8%
2005	Wisdom Microfinance Institutions (WISDOM)	-2.10%	-4.90%	3.30%	2.20%	2.80%	85.0%
2006	Wisdom Microfinance Institutions (WISDOM)	1.10%	2.60%	4.70%	1.20%	2.20%	35.3%
2007	Wisdom Microfinance Institutions (WISDOM)	-	-	2.70%	2.20%	3.30%	51.3%
2008	Wisdom Microfinance Institutions (WISDOM)	0.00%	0.00%	3.00%	0.00%	0.00%	60.0%
2009	Wisdom Microfinance Institutions (WISDOM)	-2.00%	-4.00%	5.00%	1.00%	1.00%	61.0%
2010	Wisdom Microfinance Institutions (WISDOM)	-1.00%	-3.00%	9.40%	0.00%	1.20%	58.4%
2011	Wisdom Microfinance Institutions (WISDOM)	-2.60%	-5.30%	2.11%	0.87%	1.52%	41.1%
2012	Wisdom Microfinance Institutions (WISDOM)	1.30%	2.70%	1.40%	-1.00%	0.00%	64.0%
2003	Wasasa Microfinance Institution (Wasasa)	1.70%	2.40%	5.90%	1.20%	1.20%	79.6%
2004	Wasasa Microfinance Institution (Wasasa)	3.40%	5.90%	0.10%	4.50%	4.50%	100.0%
2005	Wasasa Microfinance Institution (Wasasa)	-5.10%	-	7.60%	4.40%	4.40%	52.8%
2006	Wasasa Microfinance Institution (Wasasa)	-1.60%	-3.40%	0.90%	4.30%	4.30%	52.1%
2007	Wasasa Microfinance Institution (Wasasa)	0.30%	0.70%	1.70%	-0.30%	0.20%	98.0%
2008	Wasasa Microfinance Institution (Wasasa)	6.00%	19.00%	2.00%	2.00%	0.00%	40.0%
2009	Wasasa Microfinance Institution (Wasasa)	8.00%	25.00%	1.00%	0.00%	0.00%	97.0%
2010	Wasasa Microfinance Institution (Wasasa)	3.00%	10.00%	4.10%	-0.30%	0.00%	77.8%
2011	Wasasa Microfinance Institution (Wasasa)	6.40%	18.50%	2.25%	0.75%	0.90%	92.0%
2012	Wasasa Microfinance Institution (Wasasa)	7.50%	23.10%	1.30%	-0.40%	0.30%	104.9%

Appendix v:

LIST OF MICROFINANCE INSTITUTIONS USED IN THE RESEARCH (AGED MORE THAN 10 YEARS)

S/N	MFI
1	Addis Credit & Savings Institution (AdCSI)
2	Africa Village Financial Service (AVFS)
3	Amhara Credit & Savings Institution (ACSI)
4	Buussa Gongofa Microfinance Institution (BUUSA)
5	Dedebit Credit & Savings Institution (DECSI)
6	Meklit Microfinance Institution(Meklit)
7	OMO Microfinance Institution (OMO)
8	Oromia Credit & Savings S.C (OCSSCO)
9	Poverty Eradication and community empowerment(PEACE)
10	Specialized Financial & Promotional Institution (SFPI)
11	Wasasa Microfinance Institution (Wasasa)
12	Wisdom Microfinance Institutions (WISDOM)
13	ESHET
14	SMFI
15	GASHA

Chapter One

1. Introduction

1.1 Background to the study

The adequate management of credit risk in financial institutions is critical for the survival and growth of financial institutions. In the case of rural banks, the issue of credit risk is of greater concern because of the higher levels of perceived risk resulting from some of the characteristics of clients and business conditions that they find themselves in. Credit risk management is a structured approach to managing uncertainties through risk assessment, development of strategies to manage it and mitigation of risk using managerial resources. The strategies include transferring to another party, avoiding the risk, reducing the negative effects of the risk, and accepting some or all of the consequences of a particular risk.

Hull (2007) explains that one of the basic formation of every organization, most importantly a banker is to understand the portfolio of risk it faced currently and the risk it plans to take in future. Oldfield and Santomero (1997) posited that risks facing all financial institutions can be segmented into three separate types from a management perspective. These are (i) risk that can be eliminated or avoided by simple business practices (ii) risk that can be transferred to other participants and (iii) risk that must be actively managed at the firm level.

In the review of Sinkey (2002), modern risk management in the banking industry can be highlighted by five verbs and these are; identify, measure, price, monitor and control. This process of risk management is very much important to the rural banking industry since most of their clients are susceptible to co-variant risk, market risk and credit risk.

Managing financial institutions has never been easy, but in recent years it has become even more difficult because of greater uncertainty in the economic environment. Credit management is one of the most important activities in any company and cannot be

overlooked by any economic enterprise engaged in credit irrespective of its business nature. If the microfinance institutions (MFIs) do not manage their credit risks well, they are likely to fail to meet their social and financial objectives. When poorly managed risks begin to result in financial losses, donors, investors, lenders, borrowers and savers tend to lose confidence in the organization and funds begin to dry up. When funds dry up, microfinance institutions (MFIs) are not able to meet their social objective of providing services to the poor and quickly go out of business.

As with any financial institution, the biggest risk in microfinance is default risk. Credit risk is a particular concern for MFIs because most micro lending is unsecured (i.e., traditional collateral is not often used to secure microloans) Churchill and Coster (2001). The MFIs' clients are those who cannot get credit from banks and such other financial institutions due to the lack of the ability to provide guarantee or security against the money borrowed. Many banks do not extend credit to these kinds of people due to the high default risk for repayment of interest and in some cases the principal amount itself. Therefore, these institutions required to design sound credit management that entails the identification of existing and potential risks inherent in lending activities.

Profitability is a suitable mechanism for achieving long term viability and sustainability of the microfinance industry. At the micro level, profitability is a precondition to a competitive microfinance industry and the cheapest source of capital, without which no firm would draw external capital. MFIs profits are also an important source of equity, if profits are reinvested this may promote financial stability. By minimizing the probability of financial crisis, remarkable profits are vital in reassuring MFIs' stakeholders, including investors, borrowers, suppliers and regulators. At the macro level, a profitable microfinance industry is better placed to overcome negative shocks and contribute meaningfully to the stability of the overall financial system (Muriu, 2011).

Currently, Ethiopian microfinance institutions are playing crucial roles in improving the life of poor societies and economic development of the country as a whole. Accordingly, their loan outstanding is substantially increasing (589 million birr in 2003 to 7.15 billion birr in 2011, AEMFI performance analysis report, 2012). With this regard, the vital objective of

MFIs is poverty alleviation. To do so, their loan portfolios should be secured, and can be collected in order to facilitate loan disbursement to other clients. As the loans provided are repaid on the contract date, the MFIs more reach poor people in finance, which may in turn to increase loan portfolios quality.

1.2 Statement of the problem

Credit risk management challenges are implicit in financial institutions (including micro finance institutions) activities because credit risk events are typically uncertain (Laurentis 2009). Therefore, as Nancy (2001) noted an effective credit risk management process is required to help institution's top leadership establish rules to prevent operating losses due to human error, employee carelessness, technological malfunction or fraud. To illustrate, a micro finance's management may put into place internal controls and procedures as well as periodic internal audit reviews to ensure that employees comply with rules when performing duties in credit risk management. A credit risk management policy also may cover financial risks of financial institutions.

Al-Tamimi and Al-Mazrooei (2007) also noted that financial institutions including micro finance institutions are a business mostly associated with credit risk because of their high exposure to uncertainty. They also noted that credit risk management is one of MFI liabilities of the operations and procedures being followed. In today's dynamic environment, all micro finance institutions are exposed to potential credit risks. Due to such exposure to credit risks, efficient credit risk management is required. Chua et al. (2000) also found that managing credit risk is one of the basic tasks to be done in micro financial institutions, once it has been identified and known.

As a result, effective and sound credit risk management is a foundation for the safe and sound operation of a micro finance institution to improve their performance. In connection with this issue, different empirical studies are conducted internationally. The following are some of them.

The studies by Michael (2006) and Samuel (2006) tries to touch the issue of credit risk management in some micro finance institutions in Ethiopia but they did not assess

exhaustively the performance of micro finance institutions in credit risk management. For example the study by Samuel (2006) only focuses on one micro finance institution.

Laurentis and Mattei (2009) in their study of Lessors' recovery risk management capability shows that the development of modern reliable systems of risk management like credit scoring can enhance even more those management capabilities.

In Ethiopia, the studies by Wolday (2001), Befkadu (2007), Zigju (2008), and Michael (2006) focus on progress of micro finance institutions in terms of number of clients, loan amount and number of branches the institutions have throughout the country.

Wenner et al. (2007) conducted research on managing credit risk in financial Institutions in Latin America. In their study they found that donors and governments can assist in the capture and dissemination of relevant information that would serve to reduce asymmetries that contribute to credit risk.

Fernand (undated) conducted research study on managing microfinance risks; some observations and suggestions stated that risk management has become more important now and its importance will continue to grow in the future.

Factors such as the increasing competition in markets and the integration of new technology into the industry further reinforce the importance of microfinance risk management. The growing interest of MFIs further reinforces the importance of risk management in MFIs. However, it is disturbing to note that systematic risk management is still not as widespread as it should be.

Sound credit management is a prerequisite for a financial institution's stability and continuing profitability, while deteriorating credit quality is the most frequent cause of poor financial performance and condition. According to Gitman (1997), the probability of bad debts increases as credit standards are relaxed. Firms must therefore ensure that the management of receivables is efficient and effective. Such delays on collecting cash from debtors as they fall due has serious financial problems, increased bad debts and affects customer relations. If payment is made late, then profitability is eroded and if payment is

not made at all, then a total loss is incurred. On that basis, it is simply good businesses to put credit management at the front end by managing it strategically.

The empirical studies that have been reviewed in the preceding section focused on the different micro finance institutions issues that affect the performance and in effect profitability of micro finance institutions. In addition, most prior studies regarding credit risk management tried to examine the possible methods to manage credit risk including the use of credit score rating, and the impact of borrower's financial positions on credit risk management and the impact of relation of borrower and lender on credit risk management.

However, it is possible to concluded that although there have been a number of studies on credit risk management and related issues both in developed and developing countries, Ethiopia in particular, the connection between Credit Risk management and profitability has not been examined in this manner before. For instance, Andinet (2011) studied Institutional Viability and Performance in Ethiopia. Sara (2014) investigated the determinants of quality of MFIs loan portfolio. Gebrehiwot (2002) studied, Microfinance Institutions in Ethiopia: Issues of Portfolio Risk, Institutional Arrangements and Governance, in Microfinance Theory, Policy and Experience. Wolday (2000) investigated, Networking Microfinance Activities in Ethiopia: Challenges and Prospects, Association of Ethiopian Microfinance Institutions. Hence, it is difficult to believe that these studies exhaustively examined the credit risk management practice of micro finance institutions especially in our country Ethiopia.

As a result, this study is designed to fill the aforementioned gaps (particularly in our country Ethiopia) having the main objective of Credit Risk management and Profitability of Microfinance institutions in Ethiopia. Therefore, the purpose of this thesis is to look at the relationship between credit risk management and profitability.

1.3 Research Question

Given the gaps poised by the above empirical studies, this study poses the research question: "what is the relationship between credit risk management and profitability in microfinance institutions in Ethiopia?" The study hypothesizes that there is a significant

positive relationship between credit risk management and profitability. This hypothesis is based on the argument that microfinance institutions' largest credit risk is loans, although that credit risk exists throughout the other activities of microfinance institutions both on and off the balance sheet.

1.4 Objective of the study

1.4.1 General objective of the study

The general objective of the study is to measure the relationship between credit risk management and profitability of Microfinance Institutions in Ethiopia.

1.4.2 Specific objectives of the study

The specific objectives of the study are;

1. To measure the influence of Credits Risk management, proxied by PAR, LLPR, WOR & RC on Profitability, proxied by ROA.
2. To measure the influence of Credit Risk management, proxied by PAR, LLPR, WOR & RC on Profitability, proxied by on ROE
3. To assess Portfolio at Risk (PAR)
4. To assess the Loan Loss Provision Ratio (LLPR)
5. To assess the Write-Off Ratio (WOR) and
6. To assess Risk Coverage (RC) as a measure of credit risk management.

1.5 Research hypothesis

In order to achieve the problem statement and objective above, the study develops the following research hypotheses:

Hypothesis 1:

Null hypothesis: *There is no correlation between PAR>30 days, RC, LLPR, and WOR and ROE of Microfinance Institutions.*

Alternative hypothesis: *There is a correlation between PAR>30 days, RC, LLPR, and WOR and ROE of Microfinance Institutions.*

Ho: $\beta_2=\beta_3=\beta_4=\beta_5= 0$

Ha: H0 is not true

As it is stated before, between PAR>30 days, RC, LLPR, and WOR are indicators of credit risk management and ROE is one of the indicators of profitability. This hypothesis is used to test if the relationship between ROE and PAR>30 days, RC, LLPR, and WOR of Microfinance Institutions exists.

Hypothesis 2:

Null hypothesis: *There is no correlation between PAR>30 days, RC, LLPR, and WOR and ROA of Microfinance Institutions.*

Alternative hypothesis: *There is a correlation between PAR>30 days, RC, LLPR, and WOR and ROE of Microfinance Institutions.*

Ho: $\beta_2=\beta_3=\beta_4=\beta_5= 0$

Ha: H0 is not true

The hypothesis has similar expression as hypothesis 1 but uses ROA as the independent variable, which is another indicator of profitability.

1.6 Significance of the study

As it is discussed in the background and problem statements sections, the success of MFIs' operation has a paramount importance in the development effort of the country.

This study will make several contributions to both knowledge building and practice improvement in credit risk management and boosting profitability. It is expected that it will aid policy makers in their effort to revamp the sector. It shall also be of great relevance to the organizations under study as well as other financial institutions. The non-financial business firms, whether manufacturing or service oriented shall also benefit from the research findings. This is because the result of the study shall enable the users especially MFIs to appraise its credit policies and to review its operations critically for more result oriented approach in dealing with its credit facilities.

1.7 Scope of the study

This research is delimited only to the study of the relationship between credit risk management and profitability of sample MFIs from those registered at the National bank of Ethiopia.

The study seeks to analyze vigorously the credit risk management of microfinance institutions and to determine the level of the institutions credit risk exposure. Specifically, establishing the empirical association between the profitability of microfinance institutions on one hand and credit risk management as well.

Chapter two

Review of related literature

The literature review section of the study covers the theoretical review of credit risk and its management, the empirical studies review in the areas of credit risk management and profitability. Moreover, it presents the variable summary as well as the knowledge gap.

2.1 Theoretical Review

There are many definitions of risk in the academic and professional literatures (Rowe, 1977; Richie and Brindley, 2007; Collier, 2009). Risk can be conceptualized narrowly as probability or degree of loss as in accounting and finance, or more widely as “uncertain future events that could influence the achievement of the organization’s strategic, operational and financial objectives” (IFAC, 1999). This definition allows the coverage of both negative and positive risk to the achievement of organizational objectives and profitability. As such, risk is not only something to be avoided or controlled, but could also be something to be captured and utilized. Accounting professions around the world have adopted similar definitions to IFAC (1999)’s definition (IRMA, 2002; Financial Reporting Council, 2003; Standards Australia, 2004). Chatterjee (2007) defined risk “as uncertainties resulting in adverse outcome, adverse in relation to planned objectives or expectations”. Financial risks are uncertainties resulting in adverse variation of probability or outright losses. He pointed out the uncertainty aspect of risk and adverse variation in profitability. Cielens (2010) also narrowed it “as any uncertainty about a future event that threatens your organization’s ability to accomplish its mission”. She explained further by categorizing assets into the following: People - board members, volunteers, employees, clients, donors, and the general public. Property - buildings, facilities, equipment, materials, copyrights, and trademarks. Income - sales, grants, and contributions. Goodwill - reputation, stature in the community, and the ability to raise funds. She further pointed out the uncertainty about the future events and adverse variation in assets.

Diacon(1988) risks are present whenever human beings are unable to control or perfectly foresee the future. For example, risk of theft, firing, natural disaster. Similarly, there are

risks in running a business, because no business man can guarantee that he will make profits rather than losses. But although we cannot measure the risks, we can to some extent measure the term uncertainty is used where future alternatives and hence are not known, such as in speculative ventures like the outcome of space research or of possible new inventions.

2.2 The concept of risk management

Risk management introduces the modern theory of planning or decision making under uncertainty that is contingency planning (Schwartz, 2001) managers in the past have always used financial ratios are quantifying risks. In this light, decisions in the future may turn out to have a negative effect on actual result or vice-versa or actual results can prone to be very different from expected results. Risk management is therefore concerned with the identification of potential problems and eliminating or reducing the damage which they may result in if the problem materializes. Risk management is a central part of any organization's strategic management activities. It is the process whereby organizations methodically address the risks attaching to their activities with the goal of achieving sustained benefits within each activity and across the portfolio of all activities. The focus of good risk management is the identification and treatment of these risks. It increases the probability of success, and reduces both the probability of failure and the uncertainty of achieving the organization's overall objectives.

Cielens (2010) stresses the discipline aspect of risk management. Risk management is a discipline for dealing with the possibility that some future event will cause harm. It provides strategies, techniques, and an approach to recognizing and confronting any threat faced by an organization in fulfilling its mission. Also lingered that risk management information is used along with other corporate information, such as feasibility, to arrive at a risk management decision, transferring risk to another party, lessening the negative effect of risk and avoiding risk altogether are considered risk management strategies. Examples of risk management practices include: purchasing insurance; installing security systems; maintaining cash reserves; and diversification.

Jorion (1995) adapted this concept of risk management. The actual definition of risk management is the process of analyzing the exposure to risk and finding the means of handling this exposure properly. Every company weighs the pros and cons before starting out; this is done to avoid any future calamities that may lead to losses and insolvencies.

Jorion (1995) also drew the curtain line by defining risk management as “the process by which managers satisfy these needs by identifying key risks, obtaining consistent, understandable, operational risk measures, choosing which risks to reduce and which to increase and by what means, and establishing procedures to monitor the resulting risk position” he explained the need to identify risk and finding ways to mitigate the risk.

“Management,” like “risk,” can have many meanings, each valid in the appropriate context. For risk management of potential accidental losses, it is best to define “management”.

Stoner (1985) did defined “management” as a process: the process of planning, leading organizing, directing, and controlling organizational resources to achieve given objectives. Putting this definition of “management” together with our earlier definition of “risk” gives us a precise, quite concise, definition of “risk management”.

Kloman (2005) gave a comprehensive risk management by bringing out the management aspect of risk. He said “Risk management is the process of planning, leading organizing, directing, and controlling organizational resources to achieve given objectives when surprisingly; good or bad events are possible. Churchill (2001) explained that risk taken by the microfinance institutions must be calculated and later merged (2005) concept of systemic approach of it. Risk management is the process of taking calculated risks, a systematic approach that identifies and prioritizes the risks and implements strategies to mitigate the risks. This approach includes both the prevention of potential problems and the early detection of actual problems. It is a continuous process that involves staff at all levels of the organization. However, it is observed that most definitions and explanations as well as the concepts by the experts simply got to do with identifying, measuring, monitoring and controlling the exposure of risk as the definition of management goes.

2.3 Common risks found in Microfinance Institutions

Financial intermediation involves some risks, with one major challenge facing financial institutions being to identify such risks and to hedge against them. The risks vary in type and intensity for different financial institutions, whether or not they operate in the same business environment. Each microfinance bank, therefore, has to identify its own unique set of risks and to manage it in its own way if it wishes to continue to sustain its operations.

According to Fernando (2008), risk management, in relation to an MFI is the process of controlling the likelihood and potential severity of an adverse event; it is about systematically identifying, measuring, limiting, and monitoring risks faced by an institution. Services are relatively small and simple when a new microfinance bank commences operations. During the setting up of a new microfinance bank, it tends to be very aware of the financial risks that it faces, causing it to make a conscious effort to mitigate them. However, as microfinance bank grows in size and diversifies its loan portfolios, different types of risks, other than the obvious financial ones, tend to begin to manifest themselves. Generally, the following three categories of risks that might face microfinance business have been identified.

2.3.1 Liquidity risks

According to Craig and Dan (2011), liquidity risk arises when a microfinance bank is unable to meet its cash requirements or payment obligations timely and in a cost-efficient manner. Microfinance Banks have to plan the volume of loans to be approved and disbursed, the withdrawal pattern of their saving clients (where MFI is allowed to mobilize deposits), and other fund requirements for operational purposes, and should be able to match available funds against such requirements.

According to Kolari et al, in order to reduce liquidity risk, each microfinance bank branch needs to prepare a daily fund plan that guides the matching of cash inflows from loan repayment and saving deposits (that usually take place in the afternoon) with cash outflows (from draw-downs, customer withdrawals and operational expenses) for the

branch on a daily basis. Any positive balance or surplus fund should be deposited with a correspondent bank daily, while any anticipated shortfall should be covered by withdrawing cash from the bank early in the day. No overnight cash should be held by the branch, in order to eliminate the risk of fraud or theft.

As in the case of the daily fund plan, each branch should also prepare a monthly fund plan that should outline the amount of loans to be granted, the volume of saving withdrawals from customers, and the anticipated operational expenses. The preparation of the plan assists the finance department to anticipate the funding requirements of the various branches, thereby allowing the determination in advance of any potential cash shortfall or surplus facing the branches concerned. The funds should then be moved to a position where they can address the situation, while any arising idle funds are invested appropriately.

2.3.2 Market Risks

As stated by Fernando (2008), market risks are, by nature, environmental and include risks from financial losses as a result of changes in interest rates, fluctuations in foreign exchange, or mismatch in the management of long-term assets and liabilities (investment risk).

Generally, managing credit risk is an integral part of microfinance bank operating techniques, with reducing the risks requiring a major operational effort. As a provider of loan service, the MFI faces the hazard of imperfect selection of credit clients with little or no collateral security.

Armendariz de Aghion & Morduch, (2005) observed that wrong selection may occur when the bank has insufficient information to determine between good and bad customers. Mersland and Strom (2007) conclude that such knowledge is particularly important for Microfinance Banks, whose customers frequently lack a long, or any, credit history while a loan tends to be given without any collateral and the borrower is unlikely to make repayments without strenuous monitoring efforts.

2.3.3 Operational risk

Mersland and Strom (2007) said operational risks arise because of possible system or human errors in service or product delivery. Potentially, unexpected financial losses might occur as a result of a variety of issues, such as inadequate or deficient information systems, operational challenges, incompetent personnel, inadequate skill, deliberate breaches, or fraudulent tendencies. The management of such risks requires that the internal control framework is effective, the information technology (IT) used is adequate, the integrity of the employees is guaranteed, and the operating processes are streamlined. Given the various sources of operational risk, the most obvious is the interaction of loans and clients involving financial transactions. In the case of normal traditional banks, the staff undertaking credit assessment is usually well trained, with multiple levels of crosschecking put in place. Unfortunately, in the case of MFIs, there are usually numerous short-term loans of small amounts, making elaborate crosschecking not cost-effective. As a result, the possibility of both error of assessment and deliberate fraud is relatively high.

2.4 Credit Risk Exposure

The credit risk exposure (CR) is measured by the sum of the level of loans past due 30 days or more and still accruing interest namely Portfolio at Risk (PAR-30). In robustness tests it is included further measures of credit risk by estimating various econometric specifications for three additional different explanatory variables; the write-off ratio (WOR) which is the value of loans written off during the year as uncollectible, as a percentage of average gross loan portfolio over the year. An additional measure of credit risk is the Risk Coverage Ratio (RC) which is measured as the Adjusted Impairment Loss Allowance/PAR>30 Days and finally Loan Loss Reserve Ratio (LLR). This is measured as the ratio of loan loss reserves to gross loans or simply put as Loan loss reserve/Value of loans outstanding. It is an indicator of how much of the gross loan portfolio has been provided for but not charged off.

2.4.1 Loan product design

MFIs can mitigate a significant portion of default risk by designing loan products that meet client needs. Loan product features include the loan size, interest rate and fees, repayment schedule, collateral requirements and any other special terms (Amoah-Binfoh et. al., 2005) Loan products should be designed to address the specific purpose for which the loan is intended.

2.4.2 Credit Committees

Establishing a committee of persons to make decisions regarding loans is an essential control in reducing credit (and fraud) risk. If an individual has the power to decide who will receive loans, which loans will be written off or rescheduled, and the conditions of the loans, this power can easily be abused and covered up (Amoah-Binfoh et. al., 2005). While loan officers can serve on the credit committee, at least one other individual with greater authority should also be involved. The credit committee has the responsibility not only for approving loans, but also for monitoring their progress and, should borrowers have repayment problems, getting involved in delinquency management (Amoah-Binfoh et. al., 2005).

2.4.3 Delinquency Management

To minimize such delinquency MFIs can use the following delinquency management methods Institutional Culture: a critical delinquency management method involves cultivating an institutional culture that embraces zero tolerance of arrears and immediate follow up on all late payments (Amoah-Binfoh et. al., 2005). MFIs can also remind clients who have had recent delinquency problems that their repayment day is approaching.

2.4.4 Client Orientation

A logical first step toward developing a zero-tolerance institutional culture is to communicate this concept to each new client before he or she receives a loan (Amoah-Binfoh et. al., 2005).

2.4.5 Staff Incentives

Creating staff involvement in discouraging delinquency, through a staff incentives system, can be effective. Delinquency Penalties: Clients should be penalized for late payment. This could include delinquency fees pegged to the number of days late and limiting access to repeat loans based on repayment performance (Amoah-Binfoh et. al., 2005).

2.4.6 Loan Rescheduling

Given the vulnerability of the target market, it is common for borrowers to be willing but unable to repay. After carefully determining that this is indeed the case it may be appropriate to reschedule a limited number of loans. Only done under extreme circumstances, this may involve extending the loan term and/or reducing the installment size.

2.4.7 Collection Policy

There are various policies that an organization should put in place to ensure that credit management is done effectively; one of these policies is a collection policy which is needed because all customers do not pay the firms bills in time. Some customers are slow payers while some are non-payers. The collection effort should, therefore aim at accelerating collections from slow payers and reducing bad debt losses (Kariuki, 2010)

According to Abor (2005) risk management has received extensive attention from both the corporate world and the academia, because, as Shimpi (2001) puts it, it is the life blood of every organization and corporate officers to deal with it decisively wherever it appears. Risk management is an orderly process for the identification and assessment of pure loss exposure faced by an entity and the adoption of the most and appropriate technique to cater for such exposure (Redja 1930). From the forgone, the process of risk management includes identification, measurement, administration of selected techniques and control.

2.5 Profitability & credit risk management

Many researchers use the Return on Assets (ROA) or Return on Equity (ROE) to measure MFIs' or banks' profitability (Rosenberg 2009; Ogboi and Unuafefe 2013; Aemiro and Mekonnen 2012; Naveen 2012). In addition, many scholars also use Portfolio at Risk

greater than 30 days (PAR>30 days) ratio to measure credits risks management. The ROE is calculated by dividing net income (after taxes and excluding any grants or donations) by average equity over a certain period of time while ROA is calculated by dividing net income (after taxes and excluding any grants or donations) by average assets over a certain period of time (Rosenberg 2009; Mata 2010). Many researchers argue that ROA/ROE and PAR30 are strongly correlated in many cases, the negative relationship between ROA/ROE and PAR30 ratio is seen. On the other hand, some scholars revealed the positive correlation between ROA and credit risk management where most of them focused their researches on banks. For instance, Ariffin and Kassim discovered the positive and statistically strong correlations between ROA and all risk management practices in Malaysian Islamic banks while Kaaya and Pastory (2013) found out that negative correlation between bank performance and credits risks management in Tanzania, among many scholars who noted the same. Therefore, theoretically if PAR affects banks' profitability, it can also affect MFIs' profitability too.

Financial or global economic crises might also have adverse impacts on MFIs profitability. Aemiro and Mekonnen (2012) studied the financial performance of Amhara Credit and Saving Institution (ACSI) in Ethiopian MFIs during the 2007- 2009 financial crisis and they revealed that when the gross loan portfolio declined by 15.73% in the year 2009, ROA and ROE also declined due to loss of financial revenue. In addition, the portfolio at risk (PAR) had risen during 2008 and 2009 indicating declining of portfolio quality. Similarly, Seibel and Thac (2012) assessed the impacts of 2008 global economic crises on how the rural People's Credit Funds (PCFs) and the Central People's Credit Fund (CCF) in Vietnam were affected. The result of their study showed that from 2007 to 2008 ROE for both PCFs and CCF declined because people had become conservative and worried about the future. On their study they revealed that ROE for CCF fell from 14% to 11% because they applied conservative provisioning policy and they also experienced stronger competition which forced them to lower their deposit interest rates and this automatically decreased the earnings.

High costs of operation and high loans interest rates might affect profitability of MFIs and sometimes increase default risks for loans. Roberts (2013) found out that a stronger for-profit orientation corresponds with higher interest rates for MFI clients. This does not contribute to greater profitability though. This is because the stronger profit orientation is associated with higher MFI costs. Krahnem and Schmidt affirmed that handling a larger credit portfolio also produces additional costs of credit unions which have to be covered by a corresponding increase in interest income, implying that large credit portfolio might lower profitability. Hence, large portfolio creates high risk of credits default. Kinde (2012) revealed that MFIs profitability in Ethiopia is associated with higher loan sizes. The larger loans were associated with higher cost efficiency and hence profitability.

In Ghana, according to Gyamfi (2012) small MFFs were more vulnerable to credit risk than the bigger firms. The study revealed that the consideration percentages for borrowers' character, savings and cash flow, guarantor/collateral, business type and location and the quality of management by MFIs before granting credits were 57.9%, 47.4%, 5.8% and 10.5% respectively. The study further revealed that MFIs with 70% loans repayment rate increased from 16% to 58% from 2005 to 2007 because MFIs improved credit policies regularly. The study also noted the influence of credit risks management and MFIs' profitability and the author recommended the MFIs to encourage their clients to insure their business against risks that might affect businesses performance Naveen et al (2012) conducted a comparative study between India and Bangladesh, in terms of loans lent by customers and financial sustainability of MFI's. Their findings revealed that ROE of Indian MFIs was steadily increasing year after year, whereas the ROE of Bangladesh MFIs was decreasing gradually, indicating that India MFIs inclined towards the commercial motive versus social motive of Bangladesh MFIs. The results might also indicate that Indian MFIs were keen in managing credits risk than MFIs in Bangladesh.

2.6 Profitability of Microfinance Institutions

Profitability is an indicator of MFIs' capacity to carry risk and/or increase their capital. Profitability is one of the key concepts in this research. This is due to the topic of this research is about the relationship between credit risk management and profitability. Clear explanation to the profitability of MFIs is crucial for readers to understand the research procedure and meanings. In this section, I will involve a specific discussion of profitability and two indicators (ROE and ROA) of profitability in this research.

The determinants of commercial banks' profitability can be concluded into two categories, namely those that are management controllable (internal determinants) and those are beyond the control of management (external determinants) (Guru, 1999, p.3; Kosmidou et.al, 2005, p.3). The internal determinants reflect upon banks' management policy and decision concerning sources and uses of funds management, capital and liquidity management and expenses management (Guru et.al, 1999, p.3). As microfinance institutions are under the same category with commercial banks i.e. both are financial institutions, we can apply these categories of determinants of commercial bank's profitability to microfinance institutions. This kind of profitability factors can be examined by financial statements (Guru et.al, 1999, p.3). The external factors are environment factors and firm-specific ones (Guru et.al, 1999, p.4). This research mainly focuses on the analysis of internal determinants because our purpose is to test the impact of credit risk management to firm's profitability. The determinants reflected upon credit risk management should be included into internal policy and decisions which can be examined by financial statements.

In addition, we use ratios as indicators to represent the profitability of MFIs/banks. Guru (1999, p.7) indicated the advantages of using ratios. They mention that researchers prefer to use ratios as measurement of profitability since they are inflation invariant so that they will not be affected by changes in price level. However, it is crucial to find the appropriate indicators to maintain the accuracy of our test. Due to this problem, DuPont system is

considered because it has been widely recognized as an efficient tool in the financial analysis literature.

2.7 The theories and concepts of profitability

Profit may mean the compensation received by a firm for its managerial function. It is called normal profit which is a minimum sum essential to induce the firm to remain in business. In accounting, profit can be considered to be the difference between the purchase price and the costs of bringing to market whatever it is that is accounted as an enterprise (whether by harvest, extraction, manufacture, or purchase) in terms of the component costs of delivered goods and/or services. The Scottish economist Adam Smith (1723-1790) viewed the growth rate of capital accumulation (which took place at a rate higher than total output) as the cause and hence the total output when high increase profit but low decrease profit.

Hawley's Risk Theory of Profit states that the riskier the industry, the higher its profit rate (Hawley, 2013). Since entrepreneur takes the risks of business, he is entitled to receive profit as his rewards. Profit is commensurate with risk. The English economist David Ricardo (1772-1823) argued that a decline in the general rate of profit was caused by the diminishing marginal productivity of land. Therefore, stressing the fact that risk is very vital since diminishing marginal productivity put production at a risky position.

Knight's Theory of Risk Uncertainty: Knight's Theory of Risk Uncertainty defines pure profit as the difference between the returns actually realized by entrepreneur and competitive rate of Interest in high class gilt-edged securities (Knight, 1921). According to him, risks are of two types: insurable risk and non-insurable risk. Examples of Non-insurable Risks: Demand Fluctuation; Trade Cycle; Technological changes; Outbreak of war; Changes in Government policies; and Competition and any operating or other expenses.

Classical economists have regarded profit as the sole objective of the business in any capitalist economy. In practice, firms rarely seek to maximize profits but in the quest of

maximizing profit the risk involved is very high therefore the higher the risks the higher the profit.

2.7.1 Financial Profitability

Any ordinary business is most concerned with its profitability, since if there is no basis for profit, or break even, the business will cease to exist. MFIs differ a bit, since subsidies and donations work as a kind of safety net for some institutions, so that other priorities come first. However, due to the rapid growth of the industry, profitability has become an important priority and a step in becoming sustainable, and it is therefore important to know different ways to measure profitability.

Profitability ratios are used to determine the company's bottom line and are important to company managers and owners alike. If a small business has outside investors who have put their own money into the company, the primary owner or manager has to show profitability to the equity investors. The ratios show a company's overall efficiency and performance and are in general divided into margin ratios and return ratios. Margin ratios represent the firm's ability to translate sales dollars into profits at various stages of measurement. Ratios that show returns represent the firm's ability to measure the overall efficiency of the firm in generating returns for its investors.

Return on Assets (ROA) falls within the domain of performance measures and tracks MFIs' ability to generate income based on its assets. The ratio excludes non-operating income and donations. ROA provides a broader perspective compared to other measures as it transcends the core activity of MFIs namely, providing loans, and tracks income from operating activities including investment, and also assesses profitability regardless of the MFIs funding structure. ROA is expected to be positive as a reflection of the profit margin of the MFI, otherwise it reflects non-profit or loss. In banks and other commercial institutions, the commonest measures of profitability are Return on Equity (ROE), which measures the returns produced for the owners, and Return on Assets (ROA), which reflects that organization's ability to use its assets productively.

ROE = After-tax profits Starting (or period-average) equity

ROA = After-tax profits Starting (or period-average) assets

These are appropriate indicators for unsubsidized institutions. But donor interventions more typically deal with institutions that receive substantial subsidies, most often in the form of grants or loans at below-market interest rates. In such cases, the critical question is whether the institution will be able to maintain itself and grow when continuing subsidies are no longer available. To determine this, normal financial information must be “adjusted” to reflect the impact of the present subsidies. Three subsidy-adjusted indicators are in common use: Financial Self-sufficiency (FSS), Adjusted Return on Assets (AROA), and the Subsidy Dependence Index (SDI). In this study we will look at donor unsubsidized microfinance institutions.

2.7.2 Return on Equity (ROE)

According to the introduction of DuPont model, the hierarchy of the ratios will be illustrated. Then, the area of focus will be on the specific ratio, ROE and ROA, to expand our explanation. Return on equity (ROE) value the overall profitability of the fixed income per dollar of equity (Saunders& Marcia, 2011, p. 23). It is defined as

$$\text{ROE} = \frac{\text{Net Income}}{\text{Total Equity Capital}}$$

This measures the amount of net income after taxes earned for each dollar of equity capital contributed by the shareholders (Saunders & Marcia, 2011, p. 23). In general, stockholders prefer higher ROE (Saunders& Marcia, 2011, p. 24). However, the increasing of ROE demonstrates the increasing risk. For example, as the defined equation indicates if total equity capital decreases relative to net income, ROE will have an increase under the constant of net income (Saunders & Marcia, 2011, p.24). A large drop in equity capital

may result in a violation of minimum regulatory capital standards and increases the risk of insolvency for the banks (Saunders & Marcia, 2011, p. 24).

In order to identify potential problems, ROE can be decomposed into two component parts,

$$ROE = \frac{Net\ Income}{Total\ Assets} \times \frac{Total\ Assets}{Total\ Equity\ Capital}$$

$$ROE = ROA \times EM$$

Where:

ROA= Return on assets (a measure of profitability linked to the asset size of MFI)

EM= Equity multiplier (a measure of leverage)

Net income is the profit after tax (Saunders & Marcia, 2011, p. 24).

ROA determines the net income produced per dollar of assets for which there will be further discussion in the following part. EM measures the dollar value of assets funded with each dollar of equity capital (Saunders & Marcia, 2011, p. 24). The higher EM ratio indicates the more leverage (or debt) that is used by banks to fund its assets (Saunders & Marcia, 2011, p. 24). High EM ratio and ROA ratio have positive influence on ROE ratios (Saunders & Marcia, 2011, p. 24). However, the source of high ROE needs to be concerned by the bank's manager. For example, increasing EM generates increasing ROE ratio while the leverage of bank has also enhanced, which causes solvency risk (Saunders & Marcia, 2011, p. 24)

2.7.3 Return on Asset (ROA)

ROA, which is the ratio of net income to total assets, measure how profitable and efficient a bank's management is, based on the total assets (Guru et.al, 1999, p.7). As mentioned

in the equation of ROE, in the next step, ROA can be disintegrated into the following elements.

$$\text{ROA} = \frac{\text{Net income}}{\text{Total operating income}} \times \frac{\text{Total operating income}}{\text{Total assets}}$$

$$\text{ROA} = \text{PM} \times \text{AU}$$

Where:

PM= Net income generated per dollar of total operating income.

AU= Amount of interest and noninterest income generated per dollar of total assets

(Saunders & Marcia, 2011, p. 25)

Therefore, higher value of PM and AU ratios generate higher ROA and ROE. PM measures the capacity of bank on the expense controlling (Saunders & Marcia, 2011, p. 25). And expense control and MFIs' profit have positive relationship. AU values the bank's capacity to generate income from assets (Saunders & Marcia, 2011, p. 25). But high PM and AU value also demonstrate the potential risks. For example, PM will have an improvement when a bank reduces its expense of salaries and profits (Saunders & Marcia, 2011, p. 25). While if the reduction of expense is due to the loss of high skilled employees, the raise of PM and ROA might exist an underlying "labor quality" problem (Saunders & Marcia, 2011, p. 25).

According to (Fathi et al, 2012, p.218): ROA can be also disintegrated into the following elements;

$$ROA = \frac{II - IE}{TA} + \frac{NII - NIE}{TA} - \frac{Provisions}{TA}$$

Where:

II= Interest Income

IE= Interest Expense

NII= Non-Interest Income

NIE= Non-Interest Expense

TA= Total Assets

Then this equation can be stated as;

ROA= Net interest margin + Non interest margin–Provision to total assets

Based on the equation of ROE, we can restate ROE as

ROE= (NETIM+NONIM–PROV)* (EM)

Where NETIM is net interest margin, NONIM is non-interest margin, PROV is provision to total assets and EM is equity multiplier. This equation indicates that bank can maximize stockholders' wealth through maximizing NETIM, NONIM and EM as well as minimizing PROV (Fathi et al., 2012, p.218).

ROE and ROA are commonly used as indicators of the profitability and financial performance. Chirwa (2003) mentioned that in the previous studies, various indicators are used, including ROE, ROA and return on capital (ROC) (2003, p.567). Al- Khouri (2011) assesses the risk and performance of Gulf Cooperation Council (GCG) banking sector which involves ROA and ROE as dependent variables and credit risk, liquidity risk, capital risk and bank size as the independent variables. This research found a positive relationship between credit risk and ROA. And a significant relationship between size of banks and ROA was also founded in the same study. Al Khatib (2012) evaluated the financial performance of five Palestinian Commercial Banks by using ROA, price-to book value of equity ratio and economic value added. And his study found a positive correlation

between ROA and the size of banks. In this research, size of MFIs is not considered as the independent variable. But based on the previous study, it is considered as a control variable which will be discussed later in the following chapters. Moreover, in the Tafri et al. (2009) test of financial risk's influence to the profitability of Malaysian commercial banks also uses ROA and ROE as indicators of profitability. Ruziqa (2013) developed the similar topic to the Indonesian Conventional Banks by still using ROA and ROE to represent the financial performance. Among all the measurements, ROA and ROE are the major ones (Ongore & Kusa, 2013, p. 239; Chirwa, 2003, p.567). As previous studies listed before, ROE and ROA are commonly used as the indicators of profitability. Hence, in this research, ROA and ROE are used as profitability measures.

2.8 Microfinance Institution's Risk management

In the last part, indicators of profitability are explained. Now, the credit risk management ratios of Microfinance institutions will mainly be discussed. Before these indicators, Portfolio at Risk (PAR), Loan Loss Provision Ratio (LLPR), Write-Off ratio (WOR), and Risk Coverage (RC) are discussed, it is believed that it is necessary to start from the introduction of risks as well as risk management in microfinance institutions to provide an overview of MFI's credit risk management for readers.

2.9 Credit Risk management

Credit risk management in financial institutions has become crucial for the survival and growth of these institutions (Afriyie & Akotey, 2012, p. 3). It is a structured approach of uncertainty management through risk assessment, development of strategies to manage it and mitigation of risk using managerial resources (Afriyie & Akotey, 2012, p. 3). The strategies of credit risk management involves transferring risk to other parties, avoiding risks, reducing the negative influence of risk and accepting some or all of the consequences of a particular risk (Afriyie & Akotey, 2012, p. 3). According to Van Gestel and Baesens, credit risk is managed in various ways. The most important method starts with appropriate selection of the counterparts and products (Gestel & Baesens, 2008, p.43). And good risk assessment model and qualified credit officers are key requirements for selection strategy (Gestel & Baesens, 2008, p.43). For counterparts with higher default

risk, banks may need more collateral to reduce risk. And the pricing of product should be in line with the estimated risk.

Secondly, limitation rule of credit risk management restricts the exposure of bank to a given counterpart (Gestel & Baesens, 2008, p.43). It avoids the situation that one loss or limited number of losses endangers the bank's solvency (Gestel & Baesens, 2008, p.43). Bank's determinants on how much credit a counterpart with a given risk profile can take need to be limited. Thirdly, the allocation process of banks provides a good diversification of the risks across different borrowers of different types, industry, and geographies (Gestel & Baesens, 2008, p.43). As a result, diversification strategy spreads the credit risk thus avoids a concentration on credit risk problems. These techniques are translated in the daily organization by written procedures and policies which determine how counterparts are selected, risk profile loans are granted and above which level an expert evaluation is required (Gestel & Baesens, 2008, p.43).

In summary, a strong credit risk management avoids significant drawbacks like credit concentrations, lack of credit discipline, aggressive underwriting to high-risk counterparts and products at inadequate prices (Gestel & Baesens, 2008, p.44). And an effective credit risk management is verified by internal risk control and audit which monitor credit discipline, loan policies, approval policies, facility risk exposure and portfolio level risk (Van Gestel & Baesens, 2008, p. 44). Credit Risk in MFIs

2.10 Credit Risk management Indicators

Risk and liquidity are other words for the quality of portfolio. According to Ayayi, Ayi Gavriel (2010) there are several risk management methods are used by MFI's, such as sequential loans, credit scoring etc. E.g. when a borrower stops making payments on a loan, an MFI has two options. First, it can keep the loan on its books and try to collect the outstanding payments, thereby keeping the loan registered in the portfolio. Delinquent loans are tracked in the portfolio-at-risk ratios, depending on how long they have been in non-payment status. The other option for the MFI is to decide that it cannot collect the loan and write the loan off its books. In this case the loan registers in the write off ratio, thereby

reducing the loan portfolio by the remaining balance of the loan. Due to the critics on the issue of repayment, these variables are considered less valid, since many MFIs are suspected of misreporting this issue. Yet the hypothesis on the quality of portfolio is that good quality, i.e. low portfolio at risk and low write off ratio, means high profitability since the MFI's get high repayment (Ayayi, Ayi Gavriel 2010).

Portfolio quality is a crucial area of performance analysis, since the largest source of risk for any financial institution resides in its loan portfolio (Wolday et. al., 2014). The loan portfolio is, by far, the largest asset and, in addition, the quality of that asset and therefore, the risk it poses for the institution can be quite difficult to measure. For microfinance institutions, whose loans are typically not backed by bankable collateral, the quality of the portfolio is absolutely crucial (Wolday et. al., 2014).

Loan portfolio is the most important asset of an MFI. Portfolio quality reflects the risk of loan delinquency and determines future revenues and an institution's ability to increase outreach and serve potential and existing clients. Many MFIs have learned how to maintain loan portfolios of very high quality. In fact, leading MFIs are typically better at maintaining a higher portfolio quality than commercial banks in many countries (Wolday et. al., 2014).

2.10.1 Portfolio at Risk (PAR)

According to the bulleting Wolday et. al., (2014), the most widely used indicator of portfolio quality in the microfinance industry is Portfolio at Risk (PAR), which measures the portion of the loan portfolio "contaminated" by arrears as a percentage of the total portfolio. Although various other measures are used, PAR has emerged as the principal indicator. It is easily understandable, doe not undertake risk, and is comparable across MFIs. A microenterprise loan is considered to be at risk if a payment on it is more than 30 days late from the due date. This rule could be much stricter due to lack of bankable collateral in microfinance (Wolday et. al., 2014). Apart from this, PAR is also a sound measure of Credit Risk management which also provides information about portfolio quality of a firm. It

tries to measure the amount of loan outstanding that an MFI stands to lose in case an overdue client does not pay a single installment from the day of calculation of PAR. PAR is the proportion of loan with overdue clients to the total loan outstanding of the organization.

Portfolio at risk > 30 days, which has replaced the repayment rate, is the leading measure of loan portfolio quality, following the lead of traditional commercial banks. This relatively new and valuable measure of loan portfolio quality compares the remaining outstanding balance of loans with at least one installment overdue for a specific period, here 30 days, to the total loan portfolio. In microfinance, 30 days is a common breakpoint.

PAR is calculated as:

$$\text{PAR} = \frac{\text{Outstanding balance on arrears over 30 days} + \text{Total gross outstanding Refinanced (restructured) portfolio}}{\text{Total outstanding gross portfolio}}$$

2.10.2 Write-Off ratio (WOR)

In addition to PAR, Wolday et al. (2014) has also included Write-Off ratio (WOR). According to Stauffenberg & Ramirez (2003), WOR is a significant indicator of portfolio quality. This indicator simply represents the loans that the institution has removed from its books because of a substantial doubt that they will be recovered. The writing off of a loan is an accounting transaction to prevent assets from being unrealistically inflated by loans that may not be recovered. The writing off of a loan affects the gross loan portfolio and loan loss reserves equally. So unless provision reserves are inadequate, the transaction will not affect total assets, net loan portfolio, expenses or net income. Write-offs have no bearing whatsoever on collection efforts or on the client's obligation to repay.

Some institutions will take aggressive write-offs to attempt to sanitize their portfolios. They will then show a low portfolio at risk, and only the write-off ratio will allow an analyst to detect that this improvement is more apparent than real (Stauffenberg & Ramirez, 2003). Other MFIs, particularly NGOs resist writing off their seriously delinquent loans because, they argue, "collection efforts continue."

Write-off policies vary widely among MFIs. For example, (Stauffenberg & Ramirez, 2003) writes off loans if they have been delinquent for 90 days. The write-off ratio is therefore better understood in the context of the portfolio at risk of an institution. In fact, its main purpose is to serve as a control indicator that will allow better understanding of portfolio at risk. Write Off is the final thing the MFIs do to remove the persistently overdue accounts from the books of accounts of MFIs. In the write off the outstanding balance of the overdue accounts are reduced by making book adjustment drawing the balance from the Loan Loss Reserve. Thus after the write off, equal amount (equivalent to the overdue loan amount getting written off) is reduced both from asset side and liability side of the balance sheet (Wolday et al., 2014).

Writing-off of loan is an accounting transaction to prevent assets from being unrealistically overstated with loans that may not be recovered (Wolday et al., 2014). Write-Off ratio is calculated as follows:

$WOR = \text{Write-Off amount for a given period} / \text{Average gross portfolio}$

2.10.3 Loan Loss Provision Ratio (LLPR)

LLPR, This measure gives an indication of the expense incurred by the institution to anticipate future loan losses (Stauffenberg & Ramirez, 2003). One should expect this expense to increase in step with overall portfolio growth. For formalized MFIs, local banking and tax laws will prescribe the minimum rate at which they must make provisions to allow for loan losses. NGOs on the other hand can follow a wide variety of practices, including making no provisions at all (this is rare), provisioning a certain percentage of new loans, or relating provisions to the quality of the portfolio.

Loan Loss Provision Ratio or LLPR is a percentage (%) that reflects accumulated provision expenses (minus write-offs) and gives an indication of the management's expectation of future loan losses. It is a rough indicator of the overall quality of the portfolio, and it represents the "loan loss reserve amounts maintained by an MFI to offset the default risk in its total (outstanding) loan portfolio". Ramesh S. Arunachalam (2006).

LLPR can be calculated using the following formula;

$$\text{LLPR} = \frac{\text{Principal Amount Written Off During Period}}{\text{Average Outstanding Loan Portfolio}}$$

2.10.4 Risk Coverage (RC)

This measure shows what percent of the portfolio at risk is covered by actual loan loss reserves. According to Wolday et al. (2014) risk coverage of Ethiopian MFIs in 2012 range between 12.9 percent and 104 percent. These are much higher than the risks coverage of commercial banks. It gives an indication of how prepared an institution is for a worst-case scenario. For microfinance institutions, loan loss reserves usually range between 80% and 120% of portfolio at risk (the range was 24% to 405% for the Micro Rate 32) (Stauffenberg & Ramirez, 2003). These are much higher levels than maintained by commercial banks. To some extent, these high reserves reflect an attitude of “when in doubt, be conservative.” Microfinance is a relatively new phenomenon and the risk profile of microfinance portfolios is still not well understood. But high loan loss reserves also take into account that microloan portfolios are often not backed by collateral.

While a higher risk coverage should generally be preferred, there are cases that justify lower levels of coverage. For instance, where collateral-backed lending makes up the majority of the portfolio, a ratio well below 100% is common (Stauffenberg & Ramirez, 2003). For formalized institutions, regulators, and particularly the tax code, usually set minimum limits on provisions. For institutions with very high coverage (>200%), these seemingly high reserves may be a prudent measure to hedge future downturns in the economy or preempt poor performance of the portfolio (Stauffenberg & Ramirez, 2003). A high risk coverage ratio will compensate for the fact that strong growth tends to “dilute” portfolio at risk and the company may be preparing itself for the day when growth rates decline and portfolio risk increases.

Risk coverage must be analyzed in conjunction with portfolio at risk and write-offs, since all three are interdependent (Stauffenberg & Ramirez, 2003). As the previous section illustrates, portfolio at risk can have different risk profiles, even if the overall number is the same. A PaR30 of 5% can be highly risky if it contains a large proportion of loans that are seriously overdue, or it can be relatively safe if loans are sure to be repaid (Stauffenberg & Ramirez, 2003). As for write-offs, they reduce portfolio at risk at the stroke of a pen. To understand portfolio risk, it is essential to check whether good portfolio at risk numbers—and therefore a favorable risk coverage ratio—is the result of good client screening or massive write-offs.

RC is calculated as follows:

$$RC = \text{Loan loss reserves} / (\text{Outstanding balance on arrears over 30 days} + \text{refinanced loans})$$

2.11 Review of Previous Studies

The relationship between credit risk and profitability has been the concern of emerging studies both in developed and developing countries. From the studies on this subject matter some of the recent studies are presented in this subsection.

Poudel (2012) studied the factors affecting commercial bank performance in Nepal for the period of 2001 to 2012 and followed a linear regression analysis technique. The study revealed a significant inverse relationship between commercial bank performance measured by ROA and credit risk measured by risk coverage and default rate. Hosna et al. (2009) also found similar result with Poudel in his study of four Swedish banks covering a period of 2000 to 2008. The result showed that rate of portfolio at risk and capital adequacy ratios were inversely related to ROE though the degrees vary from one bank to the other. Such inverse relationships between profitability performance and credit risk measures were also found in other studies (Achou and Tenguh, 2008; Funso et al., 2012; Musyoki and Kadubo, 2012). Naveen et al (2012) conducted a comparative study between India and Bangladesh, in terms of loans lent by customers and financial sustainability of

MFI's. Their findings revealed that ROE of Indian MFIs was steadily increasing year after year, whereas the ROE of Bangladesh MFIs was decreasing gradually, indicating that India MFIs inclined towards the commercial motive versus social motive of Bangladesh MFIs. The result also indicates that Indian MFIs were keen in managing credits risk than MFIs in Bangladesh. Parent (2009) noted that Average ROE of banks vs MFIs registered on the microfinance MIX Market portal in Africa, central and South America and Southern Asia were roughly 18% vs13% in 2006. The study revealed that generally, the average ROE for banks was higher than those of MFIs worldwide.

Muriu (2012) found out that the ROA for MFIs in Sub Saharan countries in Africa were low. The study found out that the mean ROA and ROE for 32 countries and 210 MFIs were - 0.0128 and 0.0140 while the Minimum ROA and ROE were -0.8660, and -0.8630 respectively. The findings indicate that most MFIs in SSA were operating at loss in 1997-2008. The study also noted that age, MFI size, gearing ratio, operating efficiency, and credit risk were significantly correlated with performance. Low profitability of African MFIs might be associated with poor or lack of effective credits risk management practices.

Ayayi (2011) revealed good credits risks management resulted into high ROA for MFIs in Vietnam. Moreover, the study noted that MFIs had low credit risk because they implemented good governance which decreased the loans write-off ratio and increased the portfolio quality. Hartarska (2005) studied how governance mechanisms affect performance of MFIs in Central and Eastern Europe and the Newly Independent States. The study found out that Boards with higher proportions of women on the board reach more and poorer borrowers, have higher returns on assets. Implying that women board's members reduced the loans default risks for MFIs. Bedecarrats et al (2011) asserted that the MFIs quality of services and reasonable interest rates can reduce Portfolio at Risk (PAR30) and write off ratio (WOR) where it could reinforce clients' reimbursement capacity, which consequently reduces delinquency and default. The study also concluded that fair working conditions and training of MFIs staff also raise MFI's portfolio quality. Correspondingly, Crombrughe et al (2007) argued that high interest rate may cause an

adverse selection problem because safe borrowers with good projects or safe sources of income cannot afford to pay high interest rates, and this might increase the loans' default risks.

Most empirical studies have been done to assess the influence of credits risk management on profitability of banks (Haneef et al 2012; Achou and Tenguh 2008; Funso et al 2012; Afriyie and Akotey; n.d). Moreover, recently many scholars are motivated to study various issues concerning SACCOS in Tanzania, East Africa and the Horn of Africa. However, most of empirical studies focus on contribution of SACCOS in economic development, outreach, sustainability and the influence of institution's factors on SACCOS' efficiency or performance where most of these studies have been conducted by Kenyan scholars. Some of the recent empirical studies done in Tanzania are: Bwana and Mwakujonga (2013) and Xin and Ndiege (2013) focusing on contribution of SACCOS in economic development, outreach and sustainability.

According to Muriu, (2011) empirical study on determinants of profitability of African MFIs, under the study "what explains the low profitability of MFIs in Africa" tried to find the factors contributing to profitability of MFIs. He used Generalized Method of Moments (GMM) system using an unbalanced panel dataset comprising of 210 MFIs across 32 countries operating from 1997 to 2008. The proxies for profitability were both ROA and ROE. Credit risk measured by the sum of the level of loans past due 30 days or more (PAR>30) and still accruing interest is negatively and significantly related to MFI profitability. This study therefore finds evidence to support the conjecture that increased exposure to credit risk is normally associated with lower MFI profitability.

The other study which is undertaken by Lafourcade et al, (2006) Overview of the Outreach and Financial Performance of Microfinance Institutions in Africa by taking 163 MFIs from 25 countries show that MFIs around the world continue to demonstrate low PAR > 30 days, with a global average of 5.2 percent but African MFIs maintain relatively high portfolio quality, with an average PAR > 30 days of 4.0 percent, performing better than

their counterparts in South Asia (5.1 percent), LAC (5.6 percent), and East Asia (5.9 percent). When MFIs are faced with poor portfolio quality, they may write off the loans from their books or refinance the loans by extending the term, changing the payment schedule, or both. The result shows that loan at risk is negatively correlated with MFIs financial performance.

Obsa (2012) examined the determinants of loan portfolios quality of MFIs in Ethiopia using a sample of 15 MFIs during 2003 to 2009 period. The results showed that a significant negative relationship between an institution size and LLP and PAR-30 days. Loan ratio (outstanding loans to total assets) positively and significantly impacts PAR-30 days and WOR. The coefficient for the ratio of women borrower reveals a significant negative impact on LLPR and WOR; the estimates also show a significant inverse relation between changes in total loan and the three indicators of MFIs loan portfolio risk: LLP, PAR -30 days and WOR. Operating expense ratio, the measure of efficiency is positively related to WOR. The study did not observe any significant relationship between macroeconomic factors (changes in gross national income per capital and Inflation) and MFIs portfolio risks indicators: LLP, PAR-30 days and WOR. More currently Tilahun (2013) investigate the determinants of financial sustainability of MFIs in east Africa were poverty is a serious problem and the regression results revealed that MFIs financial sustainability is positively and significantly driven by loans intensity and size.

The empirical evidences on the relationship between leverage and portfolio risk is limited. Leverage measures the degree to which a MFI borrows money relative to its equity. Abdelghany (2005) finds that high leverage firms more likely to face portfolio risk as measured by loan loss provision.

2.12 Identification of Knowledge Gap

This study is intended to measure the relationship between credit risk management and profitability which is not included in previous studies. Most of the researches, to the best knowledge of the researcher, measured the two independently or didn't do their research

in comprehensive way. For example, Obsa (2012) used three variables as proxies for loan portfolios quality (loan loss rate, portfolios at risk over 30 days and write off ratio). Few studies focus partially the influence of credits risk management on the performance or profitability of Savings & Credits Cooperative Societies in East Africa. For instance, Odhiambo (2012) studied how the governance problem affects the Savings & Credits Cooperative Societies in Kenya and he found out that board members' face the problem of the conflict of interests where some members are interested by low interest loans than the financial viability or profitability of the Savings & Credits Cooperative Societies.

Roy (2012) evaluated the profitability of MFIs, in Assam North East India and the study revealed that despite more than 94% of borrowers were given loans for agriculture purposes, they didn't default which made the MFIs to be profitable. The results indicated that Assam MFIs were competent in managing credit risks. Moreover, the study revealed that MFIs of Assam were earning higher ROAs of 9.43% compared to the national average ROA of 1.40 and higher ROE of 19.83% compared to the national average of 12% during 2008-2010. The study further revealed that 73.5% of the MFIs did not require any collateral whereas only 26.5% of the MFIs needed collateral to provide loans to their clients.

In an attempt to fill this gap, the study intends to examine the relationship between credit risk management measured by portfolio at risk over 30 days (PAR-30), Loan loss provision ratio (LLPR), Write-Off raio (WOR) and Risk Coverage (RC) and profitability as measured by Return On Asset (ROA) and Return on Equity (ROE). In general, the lack of sufficient research on credit risk management and profitability in the context of Ethiopia and the existence of knowledge gap in the area initiate this study.

Chapter Three

Research Methodology

The previous chapter presented the literature review along with the knowledge gap which this study intended to address. The purpose of this chapter is to discuss the methods adopted throughout the study to accomplish the research objectives. The chapter is organized as follows: The first section 3.1 presents the research design adopted to examine credit risk management and profitability, while section 3.2 is about research approach. The research method and sample population and sampling technique are presented in section 3.3 and 3.4 respectively. Furthermore, section 3.5 states about Literature and data source. Data validity and Reliability are presented in section 3.6. Section 3.7 presented data analysis, and finally, section 3.8 and 3.9 presented the data collection and statistical tests respectively.

3.1 Research Design

Many researches design could be used to study business problems (Hair et. al., 2011, p.147). Depending on the way in which researchers ask their research questions and present their purpose, the research design could be classified into three groups, namely exploratory, descriptive and explanatory studies (Saunders et al., 2009, p. 138 & 139). According to Hair et. al. (2011), exploratory study is performed when the researcher has little information. This accords with Ghauri and Gronhaug (2005, p.58) who state: "When the research problem is badly understood, a (more or less) exploratory research design is adequate." It is particularly useful if you wish to clarify your understanding of a problem, such as if you are unsure of the precise nature of the problem (Saunders et al., 2009, p. 139). Therefore, exploratory research must be flexible and adaptable to change. That is to say, researchers are willing to change their direction as a result of new data that appear and new insights that occur to them (Saunders et al., 2009, p.140). A number of researchers have claimed that the exploratory approach leads to new and useful theories. But there is also the danger that the research will produce false leads or useless theories (Armstrong, 1970, p.2). Bobbie (2004) in another way states that the major shortcoming of

this research design is that it seldom provides satisfactory answers to the research question.

As to the descriptive studies, they are designed to obtain data that describe the characteristics of the topic of interest in the research (Hair et al., 2011, p.148). The objective of descriptive study is to represent an accurate profile of persons, events or situations (Robson, 2002, cited in Saunders et al., p. 140). In descriptive research, the research problem is structured and well understood (Ghauri and Gronhaug, 2005, p.58). Saunders et al. (2007) expanded the idea like “it is necessary to have a clear picture of the phenomena on which you wish to collect data prior to the collection of data.” Compared with exploratory study, descriptive study would give the readers a comfortary answer addressed to the research question. In other words, it is used for testing hypothesis (Hair et al., 2011, p.149).

The last category is explanatory study (Saunders et al., 2009, p. 140) or in some books called “causal research design” (Hair et al., 2011, p.147). In this research, the problems are well structured as in descriptive studies. In contrast to descriptive studies, the researcher is facing with “causes-and-effects” problems. The main task is to separate such causes and to say to what extent they lead to such effects (Ghauri and Gronhaug, 2005, p. 59). In other words, it is to explain the causal relationship between variables (Saunders et al., 2009, p. 140).

Based on the study of three research designs and the purpose of the research, it is decided that the explanatory study is the most suitable for this topic. Even though the research starts with the description about credit risk management and profitability of microfinance institutions, the ultimate goal is to test if the relationship exists and how the credit risk management could impact on profitability of microfinance institutions. That is to say, the aim is to find causes and effects mentioned in Ghauri and Gronhaug (2005). Hence, the research considers explanatory study as research design.

3.2 Research Approach

When conducting a research it is necessary to determine which approach is being implemented, because “scientific inquiry in practice typically involves alternating between deduction and induction. Both methods involve interplay of logic and observation. And both are routes to the construction of social theories” (Babbie, 2010, p.53). Research can be done in a deductive way in order to answer questions brought out by theoretical considerations (Bryman & Bell, 2011, p.11). Alternatively, theory can be viewed as something that occurs after the collection and analysis of data related to a project (Bryman & Bell, 2011, p.11). Deductive approach is the theory, and the hypotheses deduced from it come first and drive the process of gathering data (Bryman & Bell, 2011, p.11). While in inductive stance, theory is the outcome of research (Bryman & Bell, 2011, p.13).

The choice of research approach is important when deciding the research design. It enables us to make more learnt decision about research design, which is more than just the techniques by which data are collected and procedures by which they are analyzed (Saunders et al., 2009, p. 126). It is the overall configuration of research question about what type of subject is gathered, from where and how to interpret it in order to provide an answer to the initial questions (Saunders et al., 2009, p. 126). Additionally, it may help researchers to think about whether research strategy will work or not. For example, if researcher is interested in understanding the reason behind happening things rather than being able to describe one event, it may be more appropriate to take inductive approach rather than deductive approach (Saunders et al., 2009, p. 126). Knowledge of different research traditions allows researchers to adapt their research design to meet constraints, because there may be limited in gathering data or lacking prior knowledge of certain subject (Saunders et al., 2009, p. 126). Researchers may not be in a position to frame a hypothesis if they do not have sufficient understanding of the topic to do it (Saunders et al., 2009, p. 126).

Deductive approach requires us develop hypothesis (Saunders et al., 2009, p. 125). In this research, the relationship between credit risks management and profitability in

microfinance institutions in Ethiopia. Therefore, a hypothesis is generated which states there is a certain relationship between credit risk management and profitability. To test this hypothesis, it is planned to collect financial ratios (ROE, ROA, PAR, LLPR, WOR and RC) of 12 MFIs from their annual performance analysis Report (Bulletins). This approach reflects a deductive stance. Besides, deduction indicates the researcher should be independent of what is being observed (Saunders et al., 2009, p. 125). This research only involves quantitative data based on data collection. Hence, the researcher is independent of what is observed and the way the data is collected is objective. Another additional significant characteristic of deductive approach is it enables facts to be measured quantitatively (Saunders et al., 2009, p. 125). Obviously, in this research, purely quantitative data is used which is explicit and clear defined. The final characteristic of deduction according to Saunders is generalization which means to generate statistical results it is necessary to select sample in a sufficient numerical size (Saunders et al., 2009, p. 125). This research is intended to be based on 12 Microfinance Institutions in Ethiopia. The researcher believes these MFIs are more representative because they are in the industry for more than 10 years to influence the economy and dominate market in the financial industry. Therefore, the research approach is consistent with deductive approach.

In the inductive approach, researchers are in a purpose to feel what is going on (Saunders et al., 2009, p. 126). They tend to have a better understanding with the nature of the problem (Saunders et al., 2009, p. 126). Mostly, the researchers need to collect interview data. And by analyzing those data the result is to formulate the theory (Saunders et al., 2009, p. 126). Theory follows data rather than vice versa as this research. However, the way that the data is collected data is not through interview. In addition, inductive approach focuses on small sample of subjects but this study involves 10 years' 12 MFIs' ratios which is relatively larger than the inductive requirement. So that inductive approach does not match this research. This research approach should be a deductive approach.

3.3 Research Method

Research method can be categorized into quantitative and qualitative research. According to Bryman & Bell (2007, p.28), quantitative research emphasizes quantification of the data collection and analysis. Usually, quantitative research conducts a deductive approach to the relationship between theory and research which focus on testing of theory (Bryman & Bell, 2011, p. 28). It combines practices and norm of the natural scientific model in positivism position and embodies a view of social reality as an external, objective reality. (Bryman & Bell, 2011, p. 28)

On the contrary, qualitative research emphasizes the words rather than quantification with data. It prefers conducting an inductive approach to the relationship between theory and research which aims on the generation of theories (Bryman & Bell, 2011, p. 27). Qualitative research rejects the combination of practice and norms of natural science model (Bryman& Bell, 2011, p. 27). It emphasizes the interpretive option which refers to the way that individuals interpret the social world (Bryman & Bell, 2011, p. 27). And it embodies the view of social reality as a constantly changing property of individual's creation (Bryman & Bell, 2011, p. 27).

In this research, deductive approach has been selected which means that testing a theory rather than generating a theory is the area of focus. In order to test the hypothesis, data will be collected for the indicators, ROE, ROA, WOR, PAR, RC, & LLPR which are described in a numerical way. The data are collected directly from Ethiopian Microfinance Institutions performance analysis report Bulletins from 2003 – 2012 published by the Association of Ethiopian Microfinance Institutions Wolday et al. (2014) and from the MIX Market website. Other methods of data collection such as using questionnaire or interview are not involved into this study. As a result, the quantitative data and statistical analysis maintain the objective conception in a study of social reality. Therefore, quantitative research is more appropriate for this topic.

3.4 Sample Population and Sampling Technique

3.4.1 Sample Population

The relationship between the population and sample can be described as:

“The population in a statistical study is the entire group of individuals about which we want information” (Moore et al., 2009, p. 178).

“A sample is the part of the population from which we actually collect information used to draw conclusions about the whole” (Moore et al., 2009, p. 178).

According to this definition of population and sample, the research’s population consists of all the 32 Microfinance Institutions in Ethiopia that are registered at the national bank of Ethiopia. According to Wolday et. al (2014) currently there are thirty two (32) micro finance institutions in Ethiopia registered at the Central bank.

3.4.2 Sampling frame

This research considers those micro finance institutions with the age of 10 years and above. Out of the 32 micro finance institutions in Ethiopia, twelve are found to be with the age of ten and above ten.

3.4.3 Sampling Size

In this research, out of the total 32 micro finance institutions in Ethiopia 12 micro financial institutions are selected purposively. It is believed that those institutions which are established in early time provide more comprehensive and organized data or information on the study area and preferred to deliver the best information regarding the performance of selected micro finance institutions in credit risk management particularly information in relation with Loan repayment performance.

The purpose of the research is to test the relationship between credit risk management and profitability of Microfinance Institutions in Ethiopia from 2003 to 2012. Thus the target is all 12 Microfinance Institutions in Ethiopia located in different regions of the country.

Nevertheless, in the research, Microfinance institutions aged less than 10 years is focused.

3.5 Literature and data source

Literature and data source are the base for a research. The literature sources will help researchers to develop a good understanding of previous research and can be divided into three categories: primary, secondary and tertiary. (Saunders et al., 2009, p.68). Saunders et al. (2009, p.67) have explained in their book “Primary literature sources are the first occurrence of a piece of work.” They include published sources such as reports, some central and local government publications such as White Papers and planning documents, unpublished manuscript sources such as letters, memos and committee minutes. Secondary literature sources are the subsequent publication of primary literature. They include therefore books and journals. Tertiary literature sources are also referred to “search tools” and include indexes and abstracts as well as encyclopedias and bibliographies. They are utilized either to help to locate primary and secondary literature or to introduce a topic.

In this research, secondary sources including scientific articles from journals, e-books, Mix market website and data obtained from bulletins are used. The scientific articles are searched and collected from databases, Google scholar and some credible web sites. The key words used for searching are credit risk, credit risk management, WOR, PAR, LLPR, RC, ROE, ROA, profitability, Microfinance Institutions, and commercial banks.

The majority of the articles used are peer-reviewed and published in reputable journals, which provide a high quality of credibility of this research. However, what cannot be neglected is that the authors of the scientific articles might influence the content of their work by their own perception of the subjects they are studying. This could have a negative effect on the objectivity. To avoid such potential problem, this research strives to keep an objective side of the information with authors’ endeavor. As to the statistical part, the data

used to test the hypotheses comes from the bulletins of the Association of Ethiopian Microfinance Institutions (Wolday et al.,2014).

3.6 Data Validity and Reliability

It is important to be critical when gathering data, no matter whether it is quantitative or qualitative. There are two significant variables, validity and reliability, that need to be taken into account when gathering data.

Validity is defined as the extent to which the instrument measures what it purports to measure (Allen and Yen, 1979). Content validity pertains to the degree which the instrument fully assesses or measure the construct of interest. Validity is when the research has relevance to the problem statement (Andersen, 2002). It is defined as the degree of agreement between the theoretical and the empirical conceptual framework

The validity of the data from MIX market is considered high since this is the most comprehensive and in-depth database in the microfinance industry on MFI performance, and it is therefore the database most used by researchers and analysts. The articles and reports are considered as valid as well, as these are dealing with aspects that the data cannot always provide and therefore also offer aspects in the analysis of the problem statement. The aspect of validity can, however, be discussed due to the fact that as the industry examined in this paper is new and changing, consequently there is not as much information about this field as can be found on many established industries.

Reliability is equal to the trustworthiness of the research. It is very important to estimate the reliability of the compiled data and to remain critical. The paper can be considered reliable since the analytical and system oriented methods are being used. Data review also includes the financial statements on the annual bulletin of the Association on Microfinance Institutions in Ethiopia which are audited.

Overall, it is concluded that from an outside point of view the data has a good combination of validity and reliability and thus forming a good foundation for the paper.

3.7 Data Analysis

The data that was collected from secondary sources and analyzed using a statistical package for Windows, Eviews that is used mainly for time-series oriented econometric analysis. Descriptive statistics was used to analyze data. Furthermore, descriptions were made based on the results of the tables.

3.8 Data Collection

In order to perform regression analysis, the corresponding data need to be collected for the variables that are going to be used. The variables that are going to be used are ROE, ROA, PAR, WOR, LLPR & RC. To collect data from annual bulletins, all sample MFIs' balance sheet were examined. The annual report that has been used is the bulletin that the Association of Microfinance Institutions in Ethiopia consolidates every year not from individual microfinance institution.

3.8.1 Proxies for Credit Risk Management

In this research, four indicators are used to measure the credit risk management. Portfolio at risk greater than 30 days (PAR >30 days), Write-Off ratio (WOR), Loan loss provision ratio (LLPR), and Risk coverage (RC), which are main indicators used to assess the soundness of the performance of MFIs in Ethiopia.

3.8.2 Proxies for Profitability

Return on equity (ROE) and return on assets (ROA) are two measures for Microfinance Institutions' profitability. The data used to calculate these two ratios are retrieved from the financial statements from year 2003 to 2012 of Microfinance Institutions which are publicly available on the bulletin of Association of Microfinance Institutions in Ethiopia. All the values that are retrieved are adjusted values. The information retrieved is each Microfinance's Net Income (profit for the year), Total Assets, and Total Equity. All calculations are done by the association and presented on the financial statements of each MFIs on the bulletin. There is no own calculation.

3.9 Statistical Tests

As it has been mentioned before, the variables that are used are ROE, ROA, PAR, WOR, and RC. ROE and ROA are dependent variables while independent variables include PAR30, WOR, RC, and LLPR.

They are summarized in the following table:

Table 3.1: Variable Description

	Variable Name	Calculating Method
Dependent Variables	ROE	Adjusted Net Operating Income, net of taxes/Adjusted Average Total Equity
	ROA	Adjusted Net Operating Income, net of taxes/Adjusted Average Total Asset
Independent Variables	PAR>30 days	Outstanding balance on arrears over 30 days/Adjusted gross loan portfolio.
	WOR	Write-Off amount for a given period/ Average gross portfolio
	RC	Adjusted Loan Loss Reserve/PAR>30 days
	LLPR	Adjusted write offs, net of recoveries/ Adjusted Average gross loan portfolio

3.9.1 Multivariate Regression Analysis

To test the hypotheses that are made in the last part, it is needed to build regressions to measure the relationships of dependent and independent variables. "The regression analysis tests the statistical strength of the model as hypothesized" (Parramore & Watsham, 1997, p. 188). The technique decided to use to build the model is Ordinary

Least Squares (OLS). The general form of OLS uses a set of data to create an estimated equation like:

$$Y_i = \beta_0 + \beta_1 X_i + \epsilon_i$$

Where:

i goes from 1 to N and indicates the observation number

X_i is the independent variable

Y_i is the dependent variable

β_0 is the intercept

β_1 is the slope

ϵ_i is the residuals

The OLS is a regression estimation technique that "The least squares regression line of y on x is the line that makes the sum of the squares of the vertical distances of the data points from the line as small as possible" (Moore et. al, 2009, p.120).

The model that previous researchers have used is employed in the research, considering that there is more than one independent variable. Therefore, it is needed to move from single-independent-variable regressions to equations with more than one independent variable. That is to say, multivariate regression model needs to be introduced:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_k X_{ki} + \epsilon_i$$

Where:

i goes from 1 to N and indicates the observation number

X_i is the independent variable

Y_i is the dependent variable

β_0 is the intercept

β_1 is the slope

ϵ_i is the residuals

A multivariate regression coefficient indicates change in dependent variable associated with one unit increase in one independent variable, holding other independent variables

constant (Studenmud 2011, p.40). Based on all the information above, therefore the following regressions are formulated:

$$Y_i = \beta_0 + \beta_1 LLPR + \beta_2 WOR + \beta_3 PAR30 + \beta_4 RC + \epsilon_i$$

Where:

Y_i is ROE or ROA (two different Models will be investigated)

β_0 is the intercept

LLPR is Loan loss provision ratio

WOR is Write-Off ratio

PAR30 is Portfolio at risk > 30 days

According to Studenmud (2011, p.94), there are 7 assumptions to make for OLS estimators to be best available:

- The regression model is linear, is correctly specified, and has an additive error term.
- The error term has a zero population mean.
- All explanatory variables are uncorrelated with the error term.
- Observations of the error term are uncorrelated with each other (No serial correlation).
- The error term has a constant variance (No heteroskedasticity).
- No explanatory variable is perfect linear function of any other explanatory variables (No perfect multicollinearity).
- The error term is normally distributed. (Optional)

Hence, it is needed to test the multicollinearity and heteroskedasticity in the later parts.

3.9.2 R²

When evaluating the overall fit of a regression equation, we need to take a look at a measure named R² or the coefficient of determination. R² is the ratio of the explained sum of squares to the total sum of squares:

$$R^2 = 1 - \frac{\sum e_i^2}{\sum (Y_i - \bar{Y})^2}$$

The higher R² is, the closer the estimated regression equation fits the data. R² measures the percentage of the variation of Y around \bar{Y} that is explained by the regression equation. R² lies between 0 and 1, the closer the value to 1, the better the overall fits (Studenmund, 2011, p. 49). However, according to Gujarati (2004) R-Square greater than 20% is acceptable as long as other assumptions are available.

3.9.3 Multicollinearity

Considering LLPR, WOR, PAR>30 days, and RC are all indicators of credit risk management, there is a risk of multicollinearity. Multicollinearity happens when one or more explanatory variables are highly linearly related to each other. Perfect multicollinearity means one explanatory variable is a perfect linear function of any other explanatory variables, which is fairly easy to avoid. Imperfect multicollinearity is defined as "a linear functional relationship between two or more independent variables that is so strong that it can significantly affect the estimation of the coefficients of the variables." Multicollinearity will cause the variances and standard errors of the estimates to increase and the t-scores to decrease. However, it will not bias the estimate and the overall fit of the equation (Studenmund, 2011, p. 248-254). In this research therefore, test of multicollinearity of LLPR, WOR, PAR>30 days, and RC will be done. The simplest way to detect multicollinearity is to examine the simple correlation coefficients between the explanatories (r). If the r is high in absolute value, then the two variables are quite correlated and multicollinearity is a potential problem. Some researchers pick an absolute value of 0.80, and concern about multicollinearity when the correlation coefficient exceeds 0.80 (Studenmund, 2011, p. 258).

3.9.4 Heteroskedasticity

Heteroskedasticity exists if the variance of the distribution of error terms changes for each observation or range of observations (Studenmund, 2011, p. 98). Heteroskedasticity although does not bias the estimate of coefficient, it could cause the OLS estimates of SE (β)s to be biased, leading to unreliable hypothesis testing. In order to test for heteroskedasticity, White test for the data will be performed. It is an approach for detection of heteroskedasticity by running a regression with the squared residuals as the dependent variable (Studenmund, 2011, p. 343-351). It will be performed by Chi-square test and the appropriate test statistic is NR^2 . If NR^2 is larger than the critical Chi-square value, it is likely to face the problem of heterokedasticity (Studenmund, 2011, p. 343-351).

Chapter Four

Data Analysis, Results and Discussion

This chapter discusses the interpretation and presentation of the findings obtained from the regression output on the relationship between credit risk management and profitability of Microfinance Institutions in Ethiopia. First, the descriptive statistics of the research will be discussed in order to provide better understanding for the data. Then the results of statistical tests will be presented and described.

4.1 Descriptive Statistics

In order to give a brief overview of the data, the following table (Table 4.1) which contains the descriptive statistics of the variables (ROA, ROE, PAR>30 days, LLPR, WOR & RC) of 12 microfinance institutions in Ethiopia from 2003 to 2012 is presented. From the histogram of all the variables (Appendix 1), it is assumed that all the variables follow a normal distribution.

Table 4.1 Descriptive Statistics Of variables

VARIABLES	N	Mean	Median	MAX	MIN	Std. dev
PAR>90 days	120	0.0903	0.0305	5.800	0.000	0.5280
LLPR	120	0.0290	0.0100	0.2630	0.2630	0.0505
WOR	120	0.0299	0.0100	0.2630	-0.0010	0.0503
RC	120	0.6063	0.6190	1.2240	0.0000	0.2370
ROA	120	0.0099	0.0155	0.0950	-0.0940	0.0459
ROE	120	0.0401	0.0452	0.2830	-0.4590	0.1355

Source: EViews 6 output (2015)

ROA, ROE, PAR>30 days, LLPR, WOR, and RC are presented with their nominal values.

The variables in Table 2 include six ratios. ROA and ROE measure the microfinance institutions' profitability and PAR>30 days, LLPR, WOR & RC represent the credit risk management. The number of observations for each variable is 120. From the standard deviation we can observe the indicator with widest spread is PAR>30 which has standard

deviation of 0.528. The difference between the highest and lowest value of PAR>30 ratio is 5.8 percent. The largest ratio reaches to 5.8 percent and the smallest one is 0 percent which means sample microfinance institutions in our study have greater diversification on their PAR>30 ratio and the highest value is equal the maximum ratio.

The average values of ROE & ROA are is 4.01 percent & 0.1 percent respectively. It is also observed that the spread of ROA is 0.19 with a maximum observation of 9.5 percent and minimum observation of -9.4 percent. The standard deviation of ROE is 0.1355 which is affected by the extreme value in a slightly pattern. ROE has spread of 0.74 with a maximum observation of 0.283 and minimum observation of -0.459. The maximum value of WOR is 26.3 percent and the smallest value is -0.1 percent which is ranked in the fourth place with larger Spread of 0.264 next to ROE. The descriptive statistic table also shows that the percentage of RC ranges from 122.4 to 0.0 percentage minimum to maximum with the highest standard deviation of 0.237. LLPR has a standard deviation of 0.0505. The minimum and maximum observations are 26.3 and 26.3 percent with the lowest spread which is zero.

4.2 Multicollinearity and Heteroscedasticity Test

Before presenting the regression analysis, the model is tested for multicollinearity and heteroscedasticity. The following tables are the results for multicollinearity test:

Table 4.2 Correlation Matrix for the Regression 1 (ROA)

	ROA	WOR	PAR	LLPR	RC
ROA	1				
WOR	-0.36045	1			
PAR	-0.10902	0.071964	1		
LLPR	-0.39378	0.46753	0.057663	1	
RC	0.071975	0.125342	-0.15794	0.0328	1

Source: EViews 6 output (2015)

Table 4.3 Correlation Matrix for the Regression 2 (ROE)

	ROE	PAR	WOR	LLPR	RC
ROE	1				
PAR	-0.06324	1			
WOR	-0.41442	0.071964	1		
LLPR	-0.56038	0.057663	0.46753	1	
RC	-0.00479	-0.15794	0.125342	0.0328	1

Source: EViews 6 output (2015)

Multicollinearity is a situation where the explanatory variables are nearly linear dependent (Jurczyk, 2011, p. 262). In table 3 and table 4, we can observe that the highest correlation among all the variables is -0.56038 which is the correlation between LLPR and ROE. However, researchers always prefer an absolute value larger than 0.80 to be enough to cause multicollinearity (Studenmund, 2011, p. 258). Considering that 0.56038 is quite far from 0.80, we conclude that there is no problem of multicollinearity among the variables.

After the test for multicollinearity, the White test was also performed for heteroscedasticity. Heteroscedasticity concerns if the variance of the residuals are homogenous or not. It is another requirement for conducting OLS regression. The results of White test for regression 1 and 2 are presented in Appendix 2. The results demonstrate the observed R^2 probability value greater than 5 percent, meaning that we could not reject the null hypothesis for homoscedasticity. That is to say, our observations have no problem of heteroscedasticity.

4.3 Regression Results

In order to answer the research question, two different hypotheses has been developed in Chapter 2. And to test for those hypotheses, two regression analyses is conducted. The results of the hypotheses are summarized in the following part and the original table from eviews is presented in Appendix 3.

4.3.1 Hypothesis 1

The first regression analysis was performed to test for the first hypothesis:

$$ROE_i = \beta_0 + \beta_1LLP + \beta_2WOR + \beta_3PAR + \beta_4RC + \epsilon_i$$

Hypothesis 1 is about the correlation between PAR>30, LLPR, WOR, and RC, and ROE of Microfinance institutions.

Table 4.4 Results of Regression 1

Variables	Coef.	std. error	P - value	R2
PAR>30days	-0.0064	0.0191	0.7388	0.50899
LLPR	-1.0853	0.268	*0.0001	
WOR	-0.7732	0.2687	*0.0001	
RC	-0.0481	0.04701	0.3085	
Constant	0.1245	0.02969	0.0001	

Source: EViews 6 output (2015)

*Significant at 5%

The first regression analysis shows that the p-value for PAR>30 days is 0.7388, for LLPR is 0.0001, for WOR is 0.0001, and for RC is 0.3085. Under the condition that the level of significance is 5 percent, a p-value less than the 5 percent should be required to reject null hypothesis. Therefore, the first part of null hypothesis 1 that “there is no correlation between LLPR, WOR and ROE” should not be rejected while the second part of hypothesis 1 that “there is no correlation between PAR>30, RC and ROE” should be rejected. This means it is not possible to exclude the possibility that the effect that has been observed between PAR, RC and ROE is caused by chance while it is possible to exclude that the effect between LLPR, WOR and ROE is caused by chance. In other words, the results for regression analysis 1 demonstrate that the relationship between PAR, RC and ROE is insignificant while the relationship between LLPR, WOR and ROE is statistically significant.

4.3.2 Hypothesis 2

The first regression analysis was performed to test for the first hypothesis:

$$ROA_i = \beta_0 + \beta_1LLP + \beta_2WOR + \beta_3PAR + \beta_4RC + \epsilon_i$$

Hypothesis 2 is about the correlation between PAR, LLPR, WOR, and RC, and ROA of Microfinance institutions.

Table 4.5 Results of Regression 2

Variables	Coef.	std. error	P - value	R ²
PAR>30days	-0.00414	0.007257	0.5695	0.4113
LLPR	-0.25464	0.084273	*0.0031	
WOR	-0.23097	0.085907	*0.0082	
RC	0.03399	0.01669	0.439	
Constant	0.00414	0.0108	0.7018	

Source: EViews 6 output (2015)

*Significant at 5%

The second regression analysis shows that the p-value for PAR is 0.5695 and RC is 0.04390 and for LLPR is 0.0031 and WOR is 0.0082. Under the condition that the level of significance is 5 percent, a p-value less than the 5 percent should be required to reject null hypothesis. Therefore, the first part of null hypothesis 2 that “there is no correlation between PAR>30 & RC and ROA” should not be rejected while the second part of null hypothesis 2 that “there is no correlation between LLPR and WOR and ROA” should be rejected. This means that it is impossible to exclude that the effect between PAR and RC and ROA is caused by chance and we are able to exclude that the effect between LLPR and WOR and ROA is caused by chance. In other words, the results for regression analysis 2 demonstrate relationship between PAR and RC and ROA is insignificant while the relationship between LLPR and WOR and ROA is significant.

4.4 Insignificant result

Firstly, the discussion with the insignificant results is:

Hypothesis 1: There is no correlation between PAR, and RC and ROE of microfinance institutions.

Hypothesis 2: There is no correlation between PAR and RC and ROA of microfinance institutions.

The results (see table 5 and 6) show that the p-value for PAR>30 days and RC with dependent variable ROE is 0.7388 and 0.3085 respectively and the p-value for PAR>30 days and RC with dependent variable ROA is 0.5695 and 0.4390 respectively. Therefore, the first part of hypothesis 1 and hypothesis 2 cannot be rejected. That is to say, it is unable to find a significant relationship between existence of PAR>30 days and RC with ROE and between PAR>30 days and RC with ROA. The relationship between PAR>30 days and ROE and ROA is not significant, the correlation coefficient of PAR for both ROE and ROA is negative though. That is to say, PAR>30 days could negatively affect the MFIs' profitability.

As to the insignificant results, they could possibly come from the type II error. It is an error that occurs when one fails to reject a hypothesis when it in fact should be rejected (Bryman & Bell, 2007, p. 370). This means that the alternative hypothesis could be actually true, but the model is not able to detect this relationship. It could be attributed to omitted variables that which is needed to be take into account in order to make the results significant, such as location variables, firm size & number of employees. This could be one possible explanation that is found an insignificant relationship between PAR30 and RC and ROE and PAR30 and RC and ROA.

As it has been mentioned before, the determinant of profitability of MFIs is attributed to internal control and external control. The external determinants of profitability contain

factors such as economic environment. This could be another explanation of the insignificant relationships.

4.5 Significant result

Secondly, the significant results of the two regressions are discussed now. The results (see tables 5 and 6) show that the p-values of LLPR & WOR for ROE are 0.0001 & 0.0001 respectively. And the p-values of LLPR & WOR for ROA are 0.0082 & 0.0031 respectively. They are therefore signals that we can reject the second part of the hypothesis 1 and hypothesis 2. That is to say, the relationships between LLPR & WOR and ROE and between WOR & LLPR and ROA truly exist. According to the correlation coefficient from table 5 and 6, it is concluded that for every one percent increase in LLPR & WOR, holding other things constant, ROE for Microfinance institutions will decrease by 108.53, & 77.32 percent respectively. Again, for every one percent increase in LLPR & WOR, holding other things constant, ROA for Microfinance institutions will decrease by 25.46 percent and 23.09 percent.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In the beginning of the research it was explained that the purpose is to investigate the relationship between credit risk management and profitability of Microfinance Institutions in Ethiopia. This was done by collecting data from 12 MFIs' annual report published by AEMFI from 2003 to 2012. In order to test the relationship for the two abstract concepts, their proxies have been used. ROE and ROA have been chosen as the proxies for profitability, and PAR>30 days, LLPR, WOR and RC as proxies for credit risk management. After the data collection was finished, EViews 6 was used to test the research question. Hence, two hypotheses and two regression tests are formulated for the two dependent variables, ROE and ROA, based on the 10 years data.

Based on the ordinary least squares (OLS) and fixed effects generalized least squares, the study finds an institution loan loss provision ratio (LLPR) and write-off ratio (WOR) negatively and significantly influences return on asset(ROA) and return on equity (ROE). It implies that one should expect LLPR to increase in step with overall portfolio growth. As the loan portfolio grows the anticipation for loan loss will increase adversely affecting the profitability of MFIs. The study revealed that the credit risk management significantly negatively influences the profitability of MFIs in Ethiopia. The study noted that high amount of LLPR & WOR by the MFIs put the members' savings and deposits in risk as asserted by Achou and Tenguh (2008), who argued that bank with high credits risk, has high bankruptcy risk and puts the depositors in risk in Nigeria. Therefore, the same situation applied for MFIs which had higher amount of LLPR & WOR.

Conclusively it has been witnessed that the increase in credit risk tends to lower firm profitability, both indicators have produced the negative coefficients which tends to lower profit level. Credit risk is not a bad situation as it is related to an MFI return, from empirical theory it has been stated that the higher the risk the higher the MFI return due to the MFI ability to increase portfolio, but the MFI needs to balance and foresee the return. With

these the MFI needs to maintain substantial amount of capital reserve to absorb credit risk in event of failure, moreover the MFI need to enhance lending criteria, portfolio grading and credit mitigation techniques to reduce chance of default. Meanwhile the adoption of sound management practices and corporate governance will reduce credit risk.

5.2 Recommendations

The research was managed to fill a gap in the previous studies of testing the relationship between credit risk management and profitability in Microfinance institutions in Ethiopia. And the result of the study provides managers further understanding by how the measures of profitability are affected by the measures of credit risk management. All of these contribute valuable information for MFI's managers, financial analysts, investors and supervisors when they make relevant decisions.

Having the significant overall effect credit risk on profitability of MFIs in Ethiopia, it is suggested that a rigor credit risk management is a paramount importance. Hence, managers are advised to employee a modern credit risk management technique and diversity the earning activity of their respective MFIs.

Another contribution of the research is that companies currently have better knowledge and understanding of the impact of credit risk management to MFIs' profitability. They are supposed to reconsider how to manage and allocate LLPR & WOR, at least until further research has been established. It also provides supervisors with an expression whether the regulated ratio has effect on MFIs' profitability. Since there is a negative relationship between LLPR & WOR and profitability's indicators, supervisors might have the requirements to strengthen the LLPR & WOR to help MFIs to operate more efficiently.

Finally, it is recommend that study with large sample size and wider coverage focusing on credits risk management on the profitability of MFIs in Ethiopia should be conducted.

References

Aaron K. (2005), *Comparative Banking systems*, Design House, Limbe

Abhay.N. (2010) *Microfinance Sector*.Nidia Ltd: India

Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. [Article]. *Journal of Risk Finance* (Emerald Group Publishing Limited), 6(5), 438-445. doi: 10.1108/15265940510633505

Abdelghany E.K. (2005), "Measuring the quality of earnings", *Managerial auditing Journal*, VOI.20 No.9, pp. 1001-1015.No.9, pp.1001 – 1015.

Achou TF, Tenguh NC (2008). Bank performance and credit risk management. <http://his.divaportal.org/smash/get/diva2:2459/FULLTEXT01.pdf> [Accessed 30 October 2015]

Adamu Idama, Asongo A.I., Nyor N. (2014). Credit Risk Portfolio Management in Microfinance Banks: Conceptual and Practical Insights. *Universal Journal of Applied Science*, 2 , 111 - 119.

Aeimiro, T. and Mekonnen, D. (2012). The Financial Performance and Sustainability of Microfinance Institutions during the Current Financial Crisis: The case of Amhara Credit and Saving Institutions (ACSI) in Ethiopia. *International Journal of Business and Public Management*, Vol.2 (2): 81-87.

Afriyie, H. O. and Akotey, J.O. (n.d). *Credit Risk Management and Profitability of Selected Rural Banks in Ghana* . Catholic University College of Ghana.

Ajay K, Chatterjee, D.P. (2007). *Risk Management*. MacMillan India Ltd: India.

Al khatib, A. and Harsheh, M. (2012). Financial Performance of Palestinian Commercial Banks. *International Journal of Business and Social Science*, 3(3), pp.175--184.
Al-Khour, R. (2011).

Allen, M.J., & Yen, W.M. (1979). Introduction to measurement theory. Monterey, CA: Brooks/Cole

Almazari, A. (2012). Financial Performance Analysis of the Jordanian Arab Bank by Using the DuPont System of Financial Analysis. *International Journal of Economics and Finance*, 4(4), p.p86.

Amoah-Binfoh Kenneth, Ricky-Okine Charles, Ebenezer Bennet, Amoako Lydia Obenewaa, and Angela Nusenu (2005). Risk Management and its Impact on Profitability in Microfinance Institutions. Available at:
<http://ssrn.com/abstract=2136126> [Accessed 2 August 2015].

Andenet A. (2011). "Microfinance Institutions operating in Addis Ababa: Institutional Viability and Financial Performance" the case of ADCSI, SFPI and Wisdom MFIs.

Andersen, E.B. (2002). Estimating latent correlations between repeated testings. *Psychometrika*, 50, 3–16.

Ariffin, N.M. and Kassim, S.H. (n.d). Risk Management Practices and Financial Performance of Islamic Banks: Malaysian Evidence. 8th International Conference on Islamic Economics and Finance.

Armendariz de Aghion, B., Morduch, J. (2000). Microfinance Beyond Group Lending. *Economics of Transition*, 8, 401-420.

- Asia Development Bank (2000), Finance for the Poor: Microfinance Development Strategy. Chaver A. Rodrigo and Gonzaliz-Vega Claudio (1994), "Principles of regulation and prudential supervision and their relevance for micro enterprise finance organizations". In Mana Otero and Elisabeth Rhyne (1994). The New World of Micro-enterprise Finance: Building.
- Ayayi, A.G. (2011). Credit risk assessment in the microfinance industry: An application to a selected group of Vietnamese microfinance institutions and an extension to East Asian and Pacific microfinance institutions. *Economics of Transition* Volume 20(1) 2012,
- Bartel, M, Michael J. McCord and Robin R. Bell (1995). Financial Management Ratios.
- Befkadu B. Kereta (2007) 'Outreach and Financial Performance Analysis of Microfinance Institutions in Ethiopia', National Bank of Ethiopia, Economic Research and Monetary Policy Directorate, Addis Ababa, Ethiopia.
- Bedecarrats,F., Baur,S. and Lapenu, C.(2011). Combining social and financial performance: A paradox? Global Microcredit Summit Commissioned Workshop. Paper Presented on November 14-17, 2011 –Valladolid, Spain.
- Bethesda, MD: Development Alternatives, Inc. Anita C, (2000). Improving Internal Control: A Practical Guide for Microfinance Analyzing Profitability in Microcredit Programs.
- Bobbie, J. A. (1999). Efficiency in the European banking industry: An exploratory analysis to rank countries.
- Boudriga, A., Taktak, N. B. and Jellouli, S. (2009). Banking supervision and nonperforming loans: a cross-country analysis. *Journal of financial economic policy*, 1 (4), pp. 286-318.

- Brewer III, E. and Jackson III, W. E. (2006). A note on the “risk-adjusted” price—concentration relationship in banking. *Journal of Banking & Finance*, 30 (3), pp. 1041—1054.
- Bryman, A., & Bell, E. (2011). *Business Research Methods*. 2nd edition. Oxford: Oxford University Press.
- Buchenau, Juan and Richard L. Meyer,(2007) “Introducing Rural Finance into an Urban. Rome, Italy.
- Bwana, K. M. and Mwakujonga, J. (2013). Issues in SACCOS Development in Kenya and Tanzania: The Historical and Development Perspectives. *Developing Country Studies*, Vol.3, No.5, 2013.
- Calmeadow J. (1995).*Financial Ratio Analysis of Micro-Finance Institutions*. New York: PACT .
- Campbell Harvey, (2004) glossary. USA Chartered institute of Bankers (1996).*Insurance Management*. MacMillan: India.
- Cielens, M. 2010. *Risk assessment and Risk management*. Washington, D.C.
- Chirwa, E.W. (2003) Determinants of commercial banks' profitability in Malawi: a co-integration approach. *Applied Financial Economics*, 2003, Vol.13(8), p.565-571
- Christen, R (1997). *Banking Services for the Poor: Managing for Financial Success*. Somerville, MA: ACCION International.
- Chua, Paul Mosley, Graham A.N. Wright, Hassan Zaman Ronald T. (2000) ‘Microfinance Risk management and Poverty’

- Churchill, C. and Coster, D. (2001). Microfinance Risk Management Handbook. CARE.
- Churchill, Craig, and Dan C. (2001). CARE Microfinance Risk Management Handbook.
- Cielens, M. 2010. Risk assessment and Risk management. Washington, D.C.
- Consultative Group to Assist the Poorest (CGAP). (2003). The Impact of Microfinance. Donor Brief No. 13. Washington D.C.: CGAP.
- Craig Churchill and Dan Coster (2001). CARE Microfinance Risk Management Handbook. Available online: <http://www.adb.org/doc./books/interest>. Retrieved on 11 July 2015.
- Crombrugghe, A., Tenikue, M. and Sureda, J. (2008). Performance Analysis for a Sample of Microfinance Institutions in India. *Annals of Public and Cooperative Economics* 79:2 2008 pp. 269– 299.
- D Ricardo, (1817). *On the Principles of Political Economy and Taxation*. London.
- Damian von Stauffenberg & Alvaro Ramirez (2003), Performance Indicators for Microfinance Institutions. Technical Guide. Cataloging-in-Publication data provided by the Inter-American Development Bank Felipe Herrera Library. Available at: (www.iadb.org/sds/mic) [Accessed 23 July 2015]
- Derk, Gebrehiwot, Haftu and Million, (2009) *Ethiopian Microfinance Ownership and Governance*. AEMFI, Occasional Paper No. 27, Addis Ababa, Ethiopia.
- Davey, N.; Field, S.; Frank, R.; Barson, P.; Mcaskie, G. (1996). The Detection of fraud in mobile phone networks. *Neural Network World*, vol. 64:477-484.

- Ethiopian Business Development Service Network (EBDSN), (2004) Loan Conditions of Commercial Banks and Micro Finance Institutions, Addis Ababa Ethiopia.
- Fathi, S., Zarei, F. and Esfahani, S. S. (2012). Studying the Role of Financial Risk Management on Return on Equity. *International Journal of Business & Management*, 7 (9).
- Fernando, N.A. (2006). Understanding and Dealing with High Interest Rates on Micro credit. A Note to Policy Makers in the Asia and Pacific Region. Asian Development Bank. Retrieved <http://www.adb.org/documents/books/interest> on 20 August 2015
- Fernando, Nimal A., (2007) Low-Income Households' Access to Financial Services:
- Funso SH, Dasah J, Agyei SK (2012). "Credit risk and profitability of selected banks in Ghana" *Research Journal of finance and accounting*.
- Ghauri, P. N. and Gronhaug, K. (2005). Research methods in business studies. 2nd. Harlow, England: Financial Times Prentice Hall.
- George L. (2005). Risk Management Why and How an illustrative introduction to risk.
- Gebrehiwot A. (2002) Microfinance Institutions in Ethiopia: Issues of Portfolio Risk, Institutional Arrangements and Governance, in Microfinance Theory, Policy and Experience in Zaid N. et al. (eds). Mekelle University: Mekelle, Ethiopia.
- Gestel, T. V. and Baesens, B. (2009). Credit risk management. [E-book] Available through: OxfordScholarshipOnline<http://www.oxfordscholarship.com.proxy.ub.umu.se/view/10.1093/acprof:oso/978019545117.001.0001/acprof-9780199545117-chapter-1>[Accessed: 26 July 2015].

Giacomo De Laurentis (2009) 'Lessors' recovery risk management capability', *Managerial Finance*, Vol.35 No. 10, pp. 860-873.

Gitman, L. J. (2011). *Principles of management finance* (8th ed.)

Gloria Kyeremeh Daily Graphic 29th April, 2010

Goddard, J., Molyneux, P. and Wilson, J. O. (2004). The profitability of European banks: a cross-sectional and dynamic panel analysis. *The Manchester School*, 72 (3), pp. 363--381.

Godlewski, C. (2005). Bank capital and credit risk taking in emerging market economies. *Journal of Banking Regulation*, 6(2), pp.128--145.

Gordon N. (1999). *Banking Theory, Law and Practice*. Himalaya Publishing House: India .

Gujarati, D. (2004). *Basic Econometrics*. New York: McGraw-Hill.

Guru, B.K., Staunton, J., Balashanmugam, B., (1999). Determinants of commercial bank profitability in Malaysia. In: Paper presented at the Proceedings of the 12th Annual Australian Finance and Banking Conference, Sydney, Australia, December 16–17, 1999.

Gyamfi,G.D. (2012). Assessing the Effectiveness of Credit Risk Management Techniques of Microfinance Firms in Accra. *Journal of Science and Technology*, Vol. 32, No. 1 (2012), pp 96-103. Homewood, Illinois: Richard D. Irwin. ISBN 0256023867.

Hawley, F (2013). *Enterprise and the Productive Process a Theory*. (1907). Reprint. London: Forgotten Books, 2013. 134-5. Print.

Haneef, S., Riaz, T., Ramzan, M., Rana, M. A. Ishaq, H. M. and Karim Y. (2012). Impact of Risk Management on Non-Performing Loans and Profitability of Banking Sector of Pakistan. *International Journal of Business and Social Science* Vol. 3 No. 7; April 2012.

Hartarska, V. (2005). Governance and Performance of Microfinance Institutions in Central and Eastern Europe and the Newly Independent States. "The Future of Rural Europe in the Global Agri-Food System". Paper prepared at the XIth Congress of the European Association of Agricultural Economists (EAAE), Copenhagen, Denmark, August 24-27, 2005.

Hosna A, Manzura B, Juanjuan S (2009). "Credit risk management and profitability in commercial banks in Sweden" School of Business Economics and Law.

Hull, J. C. (2007), Risk Management and Financial Institutions, Pearson Prentice Hall, New Jersey, pp. 1-10. Institutions, Washington D.C.: Microfinance Network and GTZ) Intermediation. West Hartford, CT: Kumarian Press.

IRMA, 2002; Financial Reporting Council, 2003; Standards Australia, 2004).

Itana A., Tsehay T. and Eshetu E. (2003) Governance and Ownership Structure of MFIs in Ethiopia. AEMFI Occasional Paper No. 8: Addis Ababa, Ethiopia.

J. Scott Armstrong (1970). How to Avoid Exploratory Research. *Journal of Advertising Research* 10: 27–30.

Jeyaseelan, N (2005). Microfinance Network. Macmillan: India. K Marx, Capital, i-ni (Harmondsworth,, 1976-81)

- Josef F. Hair, Celsi M.W., Arthur H. M., Samouel P. and Page M.J. (2011). *Essentials of Business Research Methods*. 2nd edition. M.E. Sharpe
- Jurczyk, T. (2012). Outlier detection under multicollinearity. *Journal of Statistical Computation and Simulation*, 82 (2), pp. 261--278.
- Kaaya, I. and Pastory, D. (2013). Credit Risk and Commercial Banks Performance in Tanzania: a Panel Data Analysis. *Research Journal of Finance and Accounting*, Vol.4, No.16, 2013.
- Kariuki, J.N. (2010), "Effective Collection Policy." KASNEB Publishers, Nairobi.
- Kereta, B.B. (2007). Outreach and Financial Performance Analysis of Microfinance Institutions in Ethiopia. Paper Presented at African Economic Conference United Nations Conference Center (UNCC), Addis Ababa, Ethiopia, 15-17 November 2007.
- Kinde, B.A. (2012). Financial Sustainability of Microfinance Institutions (MFIs) in Ethiopia. *European Journal of Business and Management*, Vol 4, No.15, 2012.
- Knight, F. H. (1921). *Risk, uncertainty and profit*. Boston: Houghton Mifflin
- Koetter, M., J. Kolari and L. Spiergijk (2008). Efficient Competition Testing the 'Quiet Life' of U.S. Banks with Adjusted Lerner Indices (Unpublished).
- Kosmidou, K., Tanna, S., Pasiouras, F., (2005). Determinants of profitability of UK domestic banks: panel evidence from the period 1995–2002. In: *Proceedings of the 37th Annual Conference of the Money Macro and Finance (MMF) Research Group*, Rethymno, Greece, September 1–3, 2005.

Krahnen, J. P. and Schmidt, R. H. (n.d). The Theory of Credit Cooperatives: Equity and on lending in A Multi-Tier System-A Concept Paper. Poverty-Oriented Banking, Working paper No.11. Enterprise and Cooperative Development Department International Labour Office, Geneva.

Lafourcade, A-I, Jennifer Isern, Patricia Mwangi, and Matthew Brown, (2006) Overview of the Outreach and Financial Performance of Microfinance Institutions in Africa. Feature Articles, Micro banking Bulletin, April 2006.

Ledgerwood, Joanna (1999). Microfinance Handbook: An Institutional and Financial

Ledgerwood, Joanna and Kerri M. (1996). Financial Management Training for Microfinance Organization: Accounting Study Guide. Toronto: Calmeadow. Management for Business Executives. McGraw-Hill: USA.

Littlefield, E., J. Murdoch, and S. Hashemi (2003). Is microfinance an effective strategy to reach the millennium development goals? CGAP: Focus Note 24.

Mata, R.S. (2010). Diversification of Microfinance Institutions: Determinants for Entering the Remittances Market. Centre Emile Bernheim (CEB) Working Paper No. 10/043.

Mbeba, R.B (2007). MFI Internal Audit and Controls Trainer's Manual. MicroSave – Market-led solutions for financial services and MEDA.

Mersland, R. & Strom, R.O. 2007. Performance and corporate governance in microfinance institutions. [Online] Available: <http://mpr.ub.uni-muenchen.de/3887/>. Accessed: 20 June, 2015.

Meyer, R. L. (2002), "Track Record of Financial Institutions in Assisting the Poor in Asia" ADB Institute Research Paper, No 49, December 2002.

Michael Addisu (2006) 'Micro-finance Repayment Problems in the Informal Sector in Addis Ababa', *Ethiopian Journal of Business & Development* Vol1, No 2.

- Moore, David S. (red.) (2009). *The practice of business statistics: using data for decisions*. 2nd ed. New York: W.H. Freeman and Co.
- Muriu, P. (2011) "Microfinance Profitability: What explains the low profitability of African microfinance.s?", PhD thesis, Birmingham Business School, University of Birmingham.
- Musyoki D, Kadubo AS (2011). The Impact of Credit Risk Management on the Financial Performance of Banks in Kenya for the Period 2000– 2006. *Int. J. Bus. Public Manage.* 2(2):72-80.
- Naveen, K. H., Manjunath, S.J. and Srikanth, H.S. (2012). Microfinance: A comparative Study of Bangladesh and India. *IOSR Journal of Business and Management*, Volume 5, Issue 6 (Nov. - Dec. 2012), pp 27-35.
- Obsa. (2012), 'Determinants of Loan Portfolio quality: Empirical evidence from microfinance institutions in Ethiopia.
- Ogboi, C. and Unuafe, O. K. (2013). Impact of Credit Risk Management and Capital Adequacy on the Financial Performance of Commercial Banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking*, Volume:2 No.3 September 2013.
- Oldfield, G. S., and Santomero, A. M. (1997), "Risk Management in Financial Institutions," Sloan Management.
- Ongore, V. O. and Kusa, G. B. (2013). Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics & Financial Issues (IJEFI)*, 3 (1).

- Otero, M. (1999). *The Evolution of Nongovernmental Organizations Toward Financial Perspective*. Washington DC: America.
- Parent, E. (2009). Striking Balance between Affordable Rates and Sustainable Profitability in Microfinance Institutions. *Private Sector and Development*, Issue 3, September 2009.
- Parramore, K., & Watsham, T. (1997). *Quantitative Methods in Finance*. 1st edition. Oxford: Thomson.
- Poudel RPS (2012). "The impact of credit risk management in financial performance of commercial banks in Nepal". *International Journal of arts and commerce*.
- Pyle, William W., and Kermit D. Larson (1981). *Fundamental Accounting Principles*. Review, Vol. 39 No. 1, pp. 33-46.
- Qin, X. and Ndiege, B.O.(2013). Role of Financial Development in Economic Growth: Evidence from Savings and Credits Cooperative Societies in Tanzania. *International Journal of Financial Research*, Vol. 4, No. 2; 2013.
- Ramesh S, Arunachalam (2006) et al, —India Country Scan for Financial Services Design/Delivery to Low Income People, MicroNed
- Redja. G.E. 1998. *Principles of Risk Management and Insurance*. New York: Addison-Wesley.
- Rime, B. (2001). Capital requirements and bank behavior: Empirical evidence for Switzerland. *Journal of Banking & Finance*, 25(4), pp.789--805.
- Ritchie, B. & Brindley, C. (2000), "Disintermediation, disintegration and risk in the SME global supply chain", *Management Decision*, Vol. 38, No. 8, pp. 575-583.

- Roberts, P.W. (2013). The Profit Orientation of Microfinance Institutions and Effective Interest Rates. *World Development* Vol. 41, pp. 120–131, 2013. Elsevier Ltd.
- Rosenberg R. (2009). Measuring Results of Microfinance Institutions Minimum Indicators That Donors and Investors Should Track. Comprehensive Group to Assist the Poor/The World bank, Washington, DC 20433 USA.
- Rosenberg R. (2009). Measuring Results of Microfinance Institutions Minimum Indicators That Donors and Investors Should Track. Consultative Group to Assist the Poor/The World Bank, Washington, DC 20433 USA.
- Roy, A. (2012). Agricultural Finance Vs. Profitability of Microfinance Institutions – A Case Study of The MFIs of Assam. *Asia Pacific Journal of Marketing & Management Review* Vol.1 No. 3, November 2012.
- Rowe, W.D (1977), Anatomy of risk, Wiley, New York.
- Ruziqa, A. (2013). The impact of credit and liquidity risk on bank financial performance: the case of Indonesian Conventional Bank with total asset above 10 trillion Rupiah. *International Journal of Economic Policy in Emerging Economies*, 6 (2), pp. 93--106.
- S.R. DIACON and R.L. CARTER (1984-1988), Success in Insurance (Second Edition), British library.
- Salas, V. and Saurina, J. (2002). Credit risk in two institutional regimes: Spanish commercial and savings banks. *Journal of Financial Services Research*, 22(3), pp.203--224.
- Samuel (2006) 'Impact of Microfinance in Addis Ababa: The Case of Gasha Microfinance Institutions'.

Sara A. (2014). Determinants of microfinance institutions loan portfolios quality: empirical evidence from Ethiopia.

Saunders, M., Lewis, P., & Thornhill, A. (2009). Research methods for business students. 5th edition. Harlow: Financial Times Prentice Hall.

Schwartz K. (2001) Success in Insurance ,Daily Graphic 29th April, 2001

Seibel, H.D. and Thac, N.T. (2012). Growth and Resilience of Credit Cooperatives in Vietnam: in Cooperative Finance in Developing Economies, 2012 International year of Cooperatives. pp 179 197.

Shepard, Jon; Robert W. Greene (2003).Sociology and You. Ohio: Glencoe McGraw-Hill

Shimpi, P.A. (2001), Integrating Corporate Risk Management, Texere, New York, NY.

Sinkey, J. F. (2002), Commercial Bank and Financial in the Financial-Services Industry, Prentice Hall.

Smith, A. (1776). An Inquiry into the Nature and Causes of the Wealth of Nations. London.

Stanley G. (2009) Financial Market and Institutions. Prentice Hall: United States of America
Suborna, B, (2010).

Stauffenberg, A. and Rosenberg, R. (2003), The State of Microcredit –Outreach, Profitability, and Poverty, MIX/CGAP.

Studenmund, A. H. (2011). Using econometrics: a practical guide. 6. ed. Boston, Mass.: Pearson

Tafri, F. H., Hamid, Z., Meera, A. and Omar, M. A. (2010). The Impact of Financial Risks on Profitability of Malaysian Commercial Banks: 1996-2005

Thac Tam, Seibel, Hans Dieter, & Nguyen,(2010): The People's Credit Funds of Vietnam: A prudentially regulated credit cooperative movement. *Enterprise Development & Microfinance*, 21, 2: 137-153.

Wagner, S. & Bode, C. (Eds.) (2009) *Managing Risk and Security: The Safeguard of Long-Term Success for Logistics Service Providers*. Bern: HauptVerlag. Washington, D.C.: America.

Tilahun. A. (2012), "The Financial performance and Sustainability of microfinance institutions during the current financial crisis: The case of Amhara Credit and Saving Institution (ACSI) in Ethiopia, *International journal of Business and Public management* (ISSN: 2223-6244) Vol.2 (2): 81-87

World Bank (August, 2002), *Price risk management in the cocoa industry of Cameroon (Phase II report)*.

Wolday (2000) 'Corporate Governance of the Deposit Taking Microfinance Institutions in Ethiopia'.

Wolday (2000) 'Review of micro finance institutions in Ethiopia': Regulatory Framework and performance.

Zigiju (2008) 'The role of Micro credit Institutions in Urban Poverty Alleviation in Ethiopia'.