

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

PERFORMANCE MEASUREMENT OF  
SOUTH ASIAN MICROFINANCE  
INSTITUTIONS



A THESIS PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE

DEGREE OF  
Doctor of Philosophy  
IN  
Banking

AT SCHOOL OF ECONOMICS AND FINANCE,  
MASSEY UNIVERSITY, PALMERSTON NORTH,  
NEW ZEALAND.

**Uzma Bibi Shahzad**

**2015**

©2015 by Uzma Bibi Shahzad  
All rights reserved.

## Acknowledgments



In the name of Allah, the Entirely Merciful, the Especially Merciful.

---

All praises and gratitude be to Almighty Allah, to Him belongs everything that exists. The One whose countless blessings and subtle mercy helped me in ways I did not expect and motivated me to accomplish this momentous task. Moreover, immense respect for the last Prophet Muhammad (peace be upon him) whose command of “seeking knowledge is an obligation” inspired me a lot.

I wish to express my profound gratitude to my supervisors Associate Professor David Tripe, Associate Professor Hatice Ozer Balli and Dr. Claire Matthews who share their wealth of knowledge with me and taught me research. I want to acknowledge their unfailing support, infinite patience and excellent timely feedback in planning, conducting and writing this manuscript. I would like to thanks to all my teachers who taught me in school, college and university in Pakistan and New Zealand. You all played a part that helped me to achieve my goal.

Thank you David and Claire, I am obliged for their useful suggestions, corrections and timely responses especially in the initial stage of the thesis conception and for having faith on my ability to tackle what for me was a very ambitious project. I also want to express my sincere appreciation to Hatice for her gently but firmly setting deadlines and then letting me come to her office in every alternate day to work together and to meet the

objectives. I am especially indebted to her for going an extra mile with me towards the end of the project. Most importantly, for her recommendations to the head of school for providing me financial assistance that was very important for me and my family during the final stage of my PhD studies.

I am highly grateful to Higher Education Commission, Pakistan, whose financial support has been instrumental in enabling me to undertake this research project in New Zealand. I thank College of Business for their support and for being a great place to work. I would like to thank the head of school, Professor Martin Young, for providing funding to attend several local and overseas conferences and for providing financial assistance for the last months of my studies. Thanks go to the wonderful staff of the school of Economics and Finance, Sue Edwards, Cameron Rhodes, Maryke Bublitz and Fong Mee Chin for providing an excellent support system. A special thank you is also due to Dr. Faruk Balli for his valuable suggestions especially at the early stages of methodology construction. I am also very thankful to Ms. Andrea Bennett for her exhaustive proof reading of the thesis.

I would also like to thank all my fellow Postgrads at Massey University for their valuable discussions and distractions. I want to say thanks to all my friends in Pakistan for their support and prayers. A special thank you is due to my mentor, Dr. Nameeqa Firdous, for her encouragement for me to pursue for higher studies and providing her sincere support whatever and whenever required.

I am forever indebted to my mother Razia Bivi and my late father Ustad Fateh Din, my father-in-law Hafiz Ghulam Yasin and my mother-in-law Ghulam Zohra (late) for their

prayers and support that kept me going in tough times. Thanks to my sisters, Bushra Fatima and Shagufta Yasmin, my sisters and brothers-in-law and all other family members for their encouragement.

Lastly, a very warm and earnest note of thanks goes out to my husband, Hafiz Muhammad Shahzad, my daughters, Saira Fatime and Asma Zainab, without their unflinching love and encouragement I would not have been able to make it this far.



## **Abstract**

This thesis studies microfinance institutions (MFIs), which are a special type of financial institution that pursue the dual objectives of outreach and financial sustainability. The study evaluates the social and financial efficiency of a panel data set of 372 MFIs in Bangladesh, India, Nepal, Pakistan and Sri Lanka, covering the period 1998 to 2013, using performance ratios and other techniques.

The thesis introduces two new ways of measuring the social objectives of MFIs. The comparative results show that these new outreach indicators provide a better explanation of social performance of MFIs than those commonly used in the literature. We employ these new measures alongside financial sustainability to assess the performance of different types of MFIs in achieving their dual objectives. The results show that non-regulated and profit-oriented MFIs perform relatively well in terms of the dual objectives but face higher operating expenses, creating conflict between outreach and financial sustainability.

In addition, the social and financial efficiency of MFIs are evaluated using data envelopment analysis (DEA) and stochastic frontier analysis (SFA). For DEA, to obtain more robust results, a double bootstrap approach is used and we find that the financial efficiency of these institutions appears stronger than their social efficiency. Cost efficiency estimates show that, on average, South Asian MFIs are operating with the same financial and social efficiency scores, while institutional and country differences matter more for financial efficiency than for social efficiency. The results also suggest that, on average, MFIs exhibit increasing returns to scale in financial sustainability but not when

performance relative to the social objectives is measured. Similarly, improved technological progress is more evident for financial than social efficiency.

The impact of women in various roles and corporate governance on the efficiency of MFIs is investigated for the first time. The presence of female loan officers is found to have a positive effect while female board members and female borrowers show a significant negative impact on financial and social efficiency of MFIs. We find a strong positive association between the governance of an MFI and its financial and social efficiency. We find similar effects of governance and gender roles on efficiency using both the DEA and SFA approaches.

Dedicated to my mother (AMMI GEE)  
and my husband (ABU AWLADI)



## Table of contents

Acknowledgements.....	iii
Abstract.....	vii
1. Introduction.....	1
1.1. Background .....	2
1.2. Motivation .....	7
1.3. Research Contribution .....	8
1.4. Outline of the Dissertation .....	9
2. Conceptual underpinnings and related literature .....	11
2.1. Performance of MFIs.....	11
2.2. Social Performance of MFIs.....	12
2.3. Social and Financial Performance of MFIs .....	20
2.3.1. Ownership Structure of MFIs .....	26
2.3.2. Regulatory Framework of MFIs .....	27
2.3.3. Indian vs. other South Asian Countries MFIs.....	29
2.4. Efficiency of MFIs .....	33
2.4.1. Efficiency Studies using DEA .....	35
2.4.2. Efficiency Studies using SFA.....	39
2.4.3. Gender, Corporate Governance and Efficiency.....	44
2.5. Summary .....	50
3. Data Description .....	53

3.1.	Social Performance Evaluation .....	53
3.2.	Social and Financial Objectives Trade-off.....	60
3.3.	Efficiency Analysis Data – Using DEA .....	65
3.4.	Efficiency Analysis Data – Using SFA.....	71
3.5.	Summary .....	77
4.	Methodology.....	79
4.1.	Social Performance Evaluation .....	79
4.2.	Trade-off Evaluation between Social and Financial Objectives .....	83
4.3.	Efficiency Assessment Method - DEA .....	84
4.3.1.	Conventional Frontier Models .....	85
4.3.1.1.	Input-Oriented Model .....	86
4.3.1.2.	Output-Oriented Model.....	87
4.3.2.	Scale Efficiency .....	88
4.3.3.	SBM-Super Efficiency Model .....	88
4.3.4.	Truncated Bootstrapped Regression Model.....	91
4.4.	Efficiency Assessment Method-SFA .....	93
4.5.	Summary .....	98
5.	Results.....	101
5.1.	Social Performance Analysis of MFIs.....	102
5.2.	Trade-off Analysis in Social and Financial Objectives.....	110
5.2.1.	Performance of MFIs Related to Dual Objectives.....	110
5.2.2.	Split Sample Regressions .....	113

5.2.2.1.	Sub-sample of Profit-oriented and Non-profit-oriented MFIs .....	116
5.2.2.2.	Sub-sample of Regulated and Non-regulated MFIs.....	118
5.2.2.3.	Sub-sample of MFIs in India and other South Asian countries .....	121
5.2.3.	Synopsis of Social and Financial Performance Analysis.....	124
5.3.	Social and Financial Efficiency Estimates from DEA Methodology.....	125
5.3.1.	First Stage Efficiency Estimates .....	125
5.3.2.	Second Stage Regression Analysis .....	129
5.3.3.	Synopsis of Efficiency Analysis using DEA .....	135
5.4.	Social and Financial Efficiency Estimates from SFA Methodology .....	137
5.4.1.	Baseline Model Results .....	137
5.4.1.1.	Economies of Scale .....	141
5.4.1.2.	Technological Progress .....	142
5.4.1.3.	Cost Efficiency Scores .....	143
5.4.2.	Inefficiency Regressions.....	144
5.4.3.	Synopsis of Efficiency Analysis using SFA .....	146
5.5.	Summary .....	147
6.	Conclusion .....	150
6.1.	An overview of the Research .....	150
6.2.	Academic Contribution of the Thesis.....	155
6.3.	Further Research.....	157
	References.....	159



## **Appendices**

Appendix 1: Microfinance in South Asia.....	182
Appendix 2: Microfinance Regulations in South Asia .....	186
Appendix 3: Choice of Financial Ratios .....	188
Appendix 4: Research Output .....	196



## List of Tables

Table 2.1: Expected signs for variables impacting financial and social performance ....	33
Table 3.1: Variable descriptions for social performance analysis .....	55
Table 3.2: Descriptive statistics for explanatory variables of social performance .....	56
Table 3.3: Correlation among social performance variables .....	57
Table 3.4: Variable descriptions for social and financial performance analysis.....	62
Table 3.5: Descriptive statistics for explanatory variables for financial and social performance analysis.....	63
Table 3.6: Correlation among explanatory variables for financial and social performance analysis.....	64
Table 3.7: Definition of input and output variables for efficiency evaluation using DEA .....	67
Table 3.8: Descriptive statistics for efficiency evaluation using DEA .....	69
Table 3.9: Correlation among second stage variables relative to DEA analysis .....	70
Table 3.10: Variables explanation for efficiency evaluation using SFA .....	73
Table 3.11: Descriptive statistics for efficiency evaluation using SFA.....	75
Table 3.12: Correlation among variables for efficiency evaluation using SFA.....	76
Table 5.1: Outreach indicators regressions for social performance.....	104
Table 5.2: Breadth of outreach indicator: Number of active borrowers .....	107
Table 5.3: Breadth of outreach indicator: Market share of the number of borrowers ..	108
Table 5.4: Depth of outreach indicator: Market share of the number of borrowers adjusted .....	109
Table 5.5: Social and financial performance regressions.....	112
Table 5.6: Performance of profit-oriented vs non-profit-oriented MFIs.....	117

Table 5.7: Performance of regulated vs non-regulated MFIs .....	122
Table 5.8: Performance of MFIs in Indian vs other South Asian countries.....	123
Table 5.9: Average DEA efficiency scores.....	126
Table 5.10: Sub-groups efficiency scores from DEA approach .....	128
Table 5.11: Financial efficiency regressions using DEA efficiency estimates.....	131
Table 5.12: Social Efficiency regressions using DEA efficiency estimates .....	132
Table 5.13: Regression results for SFA approach.....	139
Table A3.1: Performance measurement ratios by C-GAP.....	191
Table A3.2: Financial and social DEA efficiency (technical) scores for South Asian MFIs across sample period of 2005-2012.....	192
Table A3.3: Average efficiency scores.....	195
Table A3.4: Interaction effects of risk ratios.....	196

## List of Figures

Figure 3.1: Types of MFIs .....	61
Figure 3.2: Proportion of female ratio in MFIs of each sample country.....	66
Figure 5.1: Returns to scale, 2005-2011 .....	141
Figure 5.2: Technological progress, 2005-2011 .....	143
Figure 5.3: Cost efficiency, 2005-2011.....	144



## **List of Abbreviations**

MFIs – Microfinance institutions

DEA – Data envelopment analysis

SFA – Stochastic frontier analysis

PFBs – Percentage of female borrowers

PFOs – Percentage of female loan officers

PFMs – Percentage of female board members

RQ – Research question

PAR 30 – Portfolio at risk greater than 30 days

OER – Operating expense ratio

CAR – Capital to assets ratio

GNI – Gross national income

LNAB – Logarithmic value of number of active borrowers of MFIs

LAST – Logarithmic value of total assets of MFIs

DMATURE - Dummy of mature MFIs

GDP – Gross domestic products

ROA – Returns on assets

OSS – Operational self-sufficiency

ALBPBG – Average loan balance per borrowers divided by gross national income

GLS – Generalised least square model

TE – Technical efficiency

SE – Scale efficiency

BCC - Banker, Charnes and Cooper

CCR - Charnes, Cooper and Rhodes

CRS – Constant returns to scale

VRS – Variable returns to scale

COC – Cost of physical capital

CPL – Cost of labour

COB – Cost of borrowings

RTS – Returns to scale

DMUs – Decision making units

FEAR – Frontier efficiency analysis with R

MIX market – Microfinance information exchange market

SBM – Slacks based measure

C-GAP – Consultative to Assist the Poor

Translog - Transcendental Logarithmic

MSB - Market share of microfinance borrowers

MSBA - Market share of microfinance borrowers adjusted

MENA – Middle East and North America

i.e. – Id Est (that is)

e.g. – Exempli Gratia (for example)

NGOs - Non-government organizations

SHFs - Shareholder firms

COOPs - Microfinance banks

PPP - Purchasing power parity

SBP - State Bank of Pakistan

SECP - Security and exchange commission of Pakistan

CBOs - Community-based organizations

FISA - Financial Intermediary Societies Act

