

COVER

**Lending methodologies, sustainability and depth of outreach of microfinance
institutions in Indonesia**

Ario

Diploma in Accounting, *Sekolah Tinggi Akuntansi Negara*, Indonesia

Master of International Economics and Finance, The University of Queensland,
Australia

Thesis submitted in fulfilment of the requirements of the degree of

Doctor of Philosophy

Institute for Sustainable Industries & Liveable Cities

Victoria University

Melbourne, Australia

2020

Lending methodologies, sustainability and depth of outreach of microfinance institutions in Indonesia

PhD Thesis: Ario Ario

ABSTRACT

Microfinance is a term used to describe the provision of small-scale financial services aimed primarily at the poor, and to small scale enterprises. A substantial information gap and lack of collateral cause lending in this market segment to be riskier than in other segments. In the past, policy to eradicate poverty in rural areas in many developing countries involved direct intervention, including the provision of subsidised credit at low interest rates to poor people. However, many subsidised credit programs failed and required continuous and costly funding from government (Al-Azzam, et al., 2012; Morduch, 1999; & Wenner, 1995) such as BIMAS or KUPEDES program in Indonesia (Arsyad, 2005; Baskara, 2014; & Berenbach, 1997). Microfinance emerged as an alternative way of supporting poor people, although often still involving government support. In recent decades there has been growing emphasis on the provision of microfinance on a commercial basis, without government or donor support. This has raised the question of whether, without such support, microfinance can still reach out deeply to the poorer borrowers while maintaining financial sustainability. The potential conflicts between the objectives of depth of outreach and financial sustainability are the central focus of this thesis. Although a trade-off between depth of outreach and sustainability is evident in many empirical studies (Awaworyi Churchill, 2018; Kodongo and Kendi, 2013; & Necesito, 2016), other studies suggest that non-subsidised microfinance can also possibly achieve both sustainability and depth of outreach (Ault, 2016; Gutierrez-Goiria, et al., 2017; & Quayes, 2015). It may reflect differences in lending methodology: lending through groups can help microfinance to reduce credit risk and to be sustainable for a given level of outreach, relative to lending to individuals. To see this possibility, this study specifically examines the link between the depth of outreach, sustainability, and lending methodology.

The study was approached by a mixed research methodology, involving both qualitative and quantitative components. For the qualitative approach, the primary data was collected by semi-structured interviews of the managers of the 20 institutions. Information from the interviews was analysed thematically to understand the lending methodology of

the institutions. For the quantitative approach, data on more than 2,000 individual loans was collected, from a sample of 20 microfinance institutions. A probit model and a multiple linear regression model were applied to analyse the quantitative data.

A key finding of the study is that there is evidence of a trade-off between depth of outreach and sustainability in Indonesian microfinance lending. The trade-off occurred only in individual lending where, although lending to females or smaller scale lending earned higher interest revenues to microfinance, it was exposed to higher risks because of a higher probability of default. On the other hand, this study did not find any evidence of trade-off between depth of outreach and sustainability in group lending. In addition, group lending makes the most of strong and close connectedness of group farmer members to obtain information about the borrowers and enforce loan repayment. The localised operation of the microfinance institutions in the area of a village might also facilitate an information search for borrower screening. The interviews also revealed that although individual lending was frequently secured by collateral, the collateral was rarely taken over in the case of defaulted loans. This situation might lead to a “mission drift” of the institutions, by shifting the target market for individual lending to wealthier borrowers with lower credit risk.

These results have implications for both microfinance and government policy. They suggest that, to improve depth of outreach with a given level of sustainability, microfinance institutions should provide more loans with the group lending methodology. Two financial issues constrain the extent to which MFIs can pursue this course: the generation of sufficient operating income to at least cover operating costs, and the availability of capital to support an increase in group lending. For some institutions a possible solution for this issue might be giving a greater allocation of funds for group lending while keeping a substantial proportion in individual lending. Alternatively, the microfinance institutions might be given access to cheaper loanable funds, with some government support, to assist them to cover the operating costs of a higher level of group lending to achieve social objectives. Thus if there is to be pronounced shift to group lending this will probably need to be supported by policy action on the capital front also.

Furthermore, it may be useful for the microfinance institutions to optimize the benefits of the joint liability approach by further developing appropriate group lending methodologies including peer selection, peer monitoring, and peer pressure. If group lending is indeed a key way of achieving the goal of increasing the income and welfare of low-income and poor people, the microfinance regulations should be redrafted to address the coverage restrictions for group lending separately from those for lending to individuals, perhaps

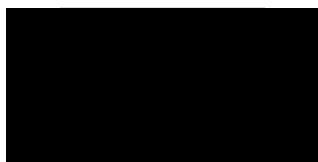
with a view to requiring more localised operations for the former. Lastly, if the Indonesian Government is interested in expanding group lending as a way of reducing poverty in rural areas it needs to address the two financial issues. First, how a portfolio of small loans to poor men and women can generate sufficient net revenue to cover operating costs in a sustainable way. Second, how capital to expand group lending can be raised from such a low income group. Possible solutions might involve the provision of interest rate subsidies and/or additional capital to microfinance institutions, targeted only to group lending.

DECLARATION

"I, Ario, declare that the PhD thesis entitled '*Lending methodologies, sustainability and depth of outreach of microfinance institutions in Indonesia*' is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work".

Signature

Date 14 August 2020



DEDICATION

Dedicated to my late parents, Roslaini and Nursal...

Without your warm love, care and support,

I wouldn't have been able to come this far in my life journey...

*I wish they were still here to appreciate this time as they would be so proud of this
achievement...*

May Allah (God all mighty) bless and grant them a place in the hereafter in paradise.

ACKNOWLEDGEMENTS

I would like to take this opportunity to express genuine and sincere gratitude for the completion of my doctorate dissertation. My gratitude first goes to the Allah 'God all mighty', the most Gracious and Merciful, for bestowing me blessings, strength, and patience to complete this research.

My deepest and wholehearted gratitude goes to my supervisors at Victoria University, Professor Peter Sheehan and Dr. Sidney Lung, who have provided me with invaluable support and feedback throughout my research journey. The support and spirit they gave with great patience have given me abundant energy and confidence to complete this research.

I would also like to extend my sincere appreciation to my initial co-supervisor at Victoria University, Dr. Enjiang Cheng, and his colleague, Professor Longyao Zhang from Nanjing Agricultural University, for their direction in the early phase of my research.

My sincere gratitude also goes to Professor Ron Adams, Professor Tarquam McKenna, Associate Professor Deborah Zion, Associate Professor Marcelle Cacciattolo, Dr. Rose Lucas and Dr. De Fazio, for their transfer of knowledge about valuable research-related skills during my first year coursework.

Great appreciation also goes to the chair and panel members of my confirmation of candidature presentation, mid-candidature review, and pre-submission review including Professor Bruce Rasmussen, Professor Joe Remenyi, Professor Bhajan Grewal, Dr. Nick Billington, Dr. Riccardo Natoli, Dr. Kim Sweeny and Van Khanh Nguyen, for their essential feedback on my research development and progress.

I am deeply indebted and grateful to my office, the Financial Service Authority of Indonesia, for the tremendous supports throughout my four year research journey in Australia. Especially, my deeply grateful goes to Pak Moch. Ihsanuddin, Pak Suparlan, and Pak Anasrul for giving me permission and support to pursue a doctorate degree in Australia.

I am also deeply grateful to the Australian Government, Department of Foreign Affairs and Trade of Australia, for granting an Australia Award Scholarship (AAS) that enabled me to get precious opportunity to experience a high standard education and multicultural learning environment in Australia. I am also thankful to AAS liaison officers in Victoria

University International, Margaret Jones, Keith Ong, Johnny Ko and the team, for their constant support and assistance.

My appreciation also goes to the Institute for Sustainable Industries & Liveable Cities and the Victoria Institute of Strategic Economic Studies (VISES) of Victoria University for their support during my coursework and research.

I would also like to send my truthful thanks to the all research participants of microfinance institutions in Central Java Province of Indonesia, without whose voluntary participation, this research would not have been possible.

Definitely, I would to extend my truthful gratitude to my beloved family, my wife Sulistya Martuti, my first daughter Bakhitah Lisario Nursal, my second daughter Alisha Lisario Nursal, my third daughter Khansa Lisario Nursal, and the youngest my son Isham Lisario Nursal, for everything they have given from Indonesia to support my study here.

Last but not the least, I am highly indebted to friends and colleagues for their help, contribution and sharing including Dicky Pelupessy PhD, Dr Roberto Akyuwen, Dr Marthin Nanere, Dr Bitra Suyatno, Gatot Yulianto, Ceceh Haryanto, Yousaf Jamal Malik, Margarita Kumnick, Minh Ngoc Ho, Nora Asih and other names that I cannot mention them here all one by one.

This thesis has been professionally copy edited by Dr Rachel Le Rossignol according to the Australian Standards for Editing Practice. Specifically the standards applied included D1, D3 to D5 and E1, E2 and E4. These standards relate to appropriate academic editing, including clarity of expression, spelling, punctuation and grammar, and ensuring the document meets the examining university's format, style and sequencing requirements.

TABLE OF CONTENTS

COVER	i
ABSTRACT	ii
DECLARATION	v
DEDICATION	vi
ACKNOWLEDGEMENTS	vii
TABLE OF CONTENTS	ix
LIST OF TABLES	xiv
LIST OF FIGURES.....	xvi
LIST OF ABBREVIATIONS	xvii
CHAPTER 1 INTRODUCTION	1
1.1 Introduction to microfinance.....	1
1.2 Research problems	5
1.3 Research gaps and questions	12
1.4 Research aims and objectives.....	13
1.5 Research design and methodology	13
1.6 Empirical and policy contribution.....	14
1.7 Thesis structure	14
CHAPTER 2 THE DEVELOPMENT AND REGULATION OF INDONESIAN MICROFINANCE INSTITUTIONS	16
2.1 Introduction	16
2.2 Indonesian microfinance institutions: A brief history	16
2.2.1 Microfinance during Indonesia’s pre-independence period	16
2.2.2 Indonesian microfinance, 1945-1966	18
2.2.3 Microfinance in Indonesia in the post-Soekarno era.....	19
2.2.4 Microfinance in Indonesia after the Microfinance Institution Act No. 1 (2013).....	22
2.3 Indonesian microfinance policies.....	24
2.4 Summary	26

CHAPTER 3 REVIEW OF LITERATURE	28
3.1 Introduction	28
3.2 Information asymmetry in the credit market.....	28
3.3 Lending methodology	31
3.3.1 Types of lending methodology.....	31
3.3.2 Group lending.....	33
3.4 Sustainability and outreach	38
3.4.1 Sustainability	38
3.4.2 Outreach	40
3.4.3 Relationship between depth of outreach and sustainability	44
3.4.4 Lending methodology comparison in outreach and sustainability performance	47
3.4.5 Related literature on Indonesian microfinance.....	54
3.5 Gender and loan terms (interest rates and loan amounts).....	57
3.5.1 Gender and interest rates	57
3.5.2 Gender and loan size	59
3.6 Relationship of interest rates and loan repayment.....	59
3.7 Conceptual framework	60
3.8 Conclusion.....	62
CHAPTER 4 RESEARCH METHODOLOGY.....	63
4.1 Introduction	63
4.2 Conceptual framework	63
4.3 Research paradigm and design.....	64
4.3.1 Mixed Methods	64
4.3.2 Research site selection	66
4.3.3 Data collection methods	67
4.4 The quantitative analysis.....	69
4.4.1 Hypotheses development.....	69
4.4.2 Defining a population.....	77
4.4.3 Sampling approaches.....	77

4.4.4 Sample size.....	79
4.4.5 Sampling criteria	79
4.4.6 Analysis methods	80
4.5 The qualitative analysis.....	92
4.5.1 Number of respondents (sample size)	93
4.5.2 Interview questions	93
4.5.3 Validity and reliability of interview questions	94
4.5.4 Analysis methods	95
4.6 Research ethics.....	96
4.7 Summary	97
CHAPTER 5 DESCRIPTIVE STATISTICS ON MICROFINANCE INSTITUTIONS LENDING	99
5.1 Quantitative data collection.....	99
5.2 Demography characteristics of borrowers.....	100
5.3 Lending outreach and sustainability.....	103
5.3.1 Outreach and sustainability indicators	103
5.3.2 Lending outreach and loans collectability.....	107
5.3.3 Interest rates and outreach.....	108
5.4 Lending method	109
5.5 Scope of relationship.....	112
5.6 Other loan characteristics.....	115
5.7 Conclusions	118
CHAPTER 6 QUALITATIVE ANALYSIS ON THE EXISTING LENDING OF MICROFINANCE INSTITUTIONS IN CENTRAL JAVA PROVINCE OF INDONESIA...	120
6.1 Introduction.....	120
6.3. Funding source of lending.....	122
6.3.1 Initial funding.....	123
6.3.2 Saving mobilisation.....	124
6.3.2 Other sources of funding	127
6.3 Farmer group and microfinance	128

6.4 Lending Methodology	133
6.4.1 Microfinance with individual lending	134
6.4.2 Microfinance with group lending	138
6.4.3 Microfinance with both individual and group lending	141
6.5 Dealing with non-performing loans	145
6.6 Lending competition	150
6.7 Conclusion.....	153
CHAPTER 7 QUANTITATIVE ANALYSIS ON RELATIONSHIP BETWEEN DEPTH OF OUTREACH AND SUSTAINABILITY	154
7.1 Introduction	154
7.2 Variables definitions	154
7.2.1 Dependent variables	154
7.2.2 Independent variables.....	155
7.2.3 Control variables	155
7.2.4 Descriptive statistics.....	157
7.3 Data screening.....	158
7.3.1 Missing Data	158
7.3.2 Multicollinearity.....	160
7.3.3 Outliers.....	160
7.3.4 Normality distribution of continuous variables.....	162
7.4 Relationship between depth of outreach and interest rates in individual and group lending	163
7.5 Relationship between depth of outreach and loan collectability	168
7.6 Loan size determinants.....	173
7.6.1 Relationship between borrower income and loan size	177
7.7 Chapter summary	183
CHAPTER 8 RESEARCH CONCLUSION: FINDINGS, LIMITATIONS, IMPLICATIONS AND FURTHER RESEARCH	186
8.1 Introduction.....	186
8.2 Results discussion and empirical contribution	187

8.2.1 Lending methodology of Indonesian microfinance institutions	188
8.2.2 Lending methodology effects on the relationship between depth of outreach and sustainability	190
8.2.3 Discussion summary and empirical contribution	200
8.3 Implications for Indonesian microfinance institutions	202
8.4 Policy implications	204
8.5 Research limitations and further work	205
REFERENCES.....	208
APPENDICES.....	224
Appendix 3.1: Literature search on group lending theories.	224
Appendix 3.2: Literature search on lending methodology, sustainability and outreach.	225
Appendix 4.1: Guideline for Interview of Microfinance’s manager	226
Appendix 4.2: Consent Forms.....	228
Appendix 4.3: Information to Participants	230
Appendix 6.1: Initial capital sources of microfinance	232
Appendix 7.1 Pearson correlation matrix.....	233
Appendix 8.1 Summary of hypotheses testing results	235

LIST OF TABLES

Table 2.1 Coverage area and capital requirement.....	25
Table 3.1 Types of lending methodology	32
Table 3.2 List of studies using loan size as proxy of income or poverty level	46
Table 3.3 Types of microfinance institution.....	55
Table 4.1 Summary of hypotheses.....	77
Table 4.2 Multivariate statistics techniques.....	83
Table 4.3 Hypotheses and the corresponding regression technique.....	84
Table 4.4 Research ethics documents.....	97
Table 5.1 Data Description	100
Table 5.2 Gender and occupation of borrowers.....	101
Table 5.3 Gender and education of borrowers.....	102
Table 5.4 Gender and age of borrowers	103
Table 5.5 Borrowers distribution by MFI and gender	104
Table 5.6 loan interest rates	104
Table 5.7 Loan collectability	105
Table 5.8 Loan collectability and borrowers' gender.....	108
Table 5.9 Mean comparison of initial loan amount based on interest rates.....	109
Table 5.10 Lending method by gender	110
Table 5.11 Lending method and initial loan amount	111
Table 5.12 Lending method and collectability	112
Table 5.13 Lending method and interest rates.....	112
Table 5.14 Scope of relationship and lending methods	113
Table 5.15 Scope of relationship and initial loan amount	113
Table 5.16 Scope of relationship and loan collectability	114
Table 5.17 Scope of relationship and interest rates.....	115
Table 5.18 Lending methods and collateral	115
Table 5.19 Loan tenure	116
Table 5.20 Instalment types and lending methods.....	116
Table 5.21 Instalment types and occupation by lending methods	117
Table 6.1 Interview dates	121
Table 6.2 Microfinance legal form	122
Table 6.3 Saving mobilisation	126
Table 6.4 The Central Java provincial governments.....	129
Table 6.5 Farmer groups distribution	132

Table 6.6 Microfinance lending methodology and funding source	134
Table 6.7 Loan requirement and collateral.....	135
Table 6.8 Borrower information source and screening	137
Table 6.9 Group lending method.....	139
Table 6.10 Group lending collateral	140
Table 6.11 Borrower selection method	141
Table 6.12 Lending method.....	143
Table 6.13 Documents and collateral requirement	144
Table 6.14 Borrower selection method	145
Table 6.15 Lending methodology and loan enforcement.....	147
Table 6.16 Lending competition	150
Table 7.1 Summary statistics of continuous variable	158
Table 7.2 Descriptive statistics of dummy variables	158
Table 7.3 Missing data by MFI and variables.....	159
Table 7.4 Standardised z-score untransformed continuous variables	161
Table 7.5 Standardised z-score of transformed LGR and ILA variables	162
Table 7.6 Skewness and Kurtosis	162
Table 7.7 The output of hierarchical interest rates (IRP) regression	164
Table 7.8 Control variables interpretation	166
Table 7.9 Interest rates regressions: by lending methodology	167
Table 7.10 The output of loan collectability regression	170
Table 7.11 Control variables interpretation	172
Table 7.12 The output of loan collectability regression: individual and group lending.....	173
Table 7.13 The output of loan size (ILALOG) regression	175
Table 7.14 Control variables interpretation of loan size regression	176
Table 7.15 The output of loan size regression by subsamples of gender and lending methodology.....	177
Table 7.16 List of studies using loan size as proxy of income or poverty level	178
Table 7.17 Hierarchical loan size regression	181
Table 7.18 Loan size regression: lending methodology.....	182
Table 7.19 Loan size regression: gender	183
Table 8.1 Previous studies on lending methodology and loan sizes	191
Table 8.2 Previous studies on gender and loan sizes.....	192
Table 8.3 Previous studies on gender and interest rates.....	194
Table 8.4 Previous studies on gender and loan performance	196
Table 8.5 Previous studies on borrower income and interest rates	198
Table 8.6 Previous studies on borrower income and loan performance.....	200

LIST OF FIGURES

Figure 3.1 Interest rates and lender's expected rate of return	30
Figure 3.2 Literature search group and individual lending	48
Figure 3.3 Search strategy for Indonesian microfinance literature	54
Figure 3.4 Conceptual framework	61
Figure 4.1 Conceptual framework	64
Figure 4.2 Mixed methods procedures.....	65
Figure 4.3 Logistic curve model for a binomial dependent variable.....	85
Figure 4.4 Cumulative Probability Function of Probit and Logit	86
Figure 5.1 Histogram of initial loan amount (ILA) in USD	106
Figure 5.2 The mean of initial loan amount and borrowers' gender.....	107
Figure 5.3 The mean of Initial Loan Amount for loan collectability	107
Figure 5.4 The mean interest rates and gender.....	108
Figure 5.5 Interest rates and loan amount	109
Figure 5.6 Distribution of borrowers based on instalment types and occupation	117
Figure 6.1 Farmer group structure	132
Figure 7.1 Box plots of IRP, LGR and ILA	161
Figure 7.2 Loan size and relationship length	179
Figure 7.3 Monthly income and borrower education level	179
Figure 7.4 Loan size and borrower income	180

LIST OF ABBREVIATIONS

AVB	Algemene Volkscredietbank
BIMAS	Bimbingan Masyarakat
BKD	Badan Kredit Desa
BKK	Badan Kredit Kecamatan
BMT	The Baitul Maal wat Tamwil
BPR	Bank Perkreditan Rakyat
BRI	Bank Rakyat Indonesia
DPR	Dewan Perwakilan Rakyat
FSA	Financial Service Authority
GDP	Gross Domestic Product
GNI	Gross National Income
GNP	Gross National Product
KUD	Koperasi Unit Desa
KUPEDES	Kredit Umum Pedesaan
KURK	Kredit Usaha Rakyat Kecil
LDKP	Lembaga Dana dan Kredit Pedesaan
LLCs	limited liability companies
LPD	Lembaga Perkreditan Desa
LPK	Lembaga Perkreditan Kecamatan
LPN	Lumbung Pitih Nagari
MFI	Microfinance Institution
NGO	Non-governmental Organization
OJK	Otoritas Jasa Keuangan
PAKDES	Paket Desember
PAKMAR	Paket Maret
PAKTO	Paket Oktober
POJK	Peraturan Otoritas Jasa Keuangan
ProFi	Promotion of Small Financial Institutions
PUAP	Pengembangan Usaha Agribisnis Pedesaan
SMEs	Small Medium Enterprises
UED-SP	Unit Ekonomi Desa – Simpan Pinjam

CHAPTER 1 INTRODUCTION

1.1 Introduction to microfinance

Microfinance is essentially a concept used to describe the provision of small-scale finance services aimed primarily at the poor and at small medium enterprises (SMEs). The Asian Development Bank (2000, p. 2) refers to microfinance as “the provision of a broad range of financial services such as deposits, loans, payment services, money transfers, and insurance to poor and low-income households and their microenterprises”. Similarly, Beck (2015, p. 3) defines it as “...attempts to provide financial services to households and micro-enterprises that are excluded from traditional commercial banking services”. These financial services may cover not only loans but also other financial services such as deposits and insurance (García-Pérez, Muñoz-Torres, & Fernández-Izquierdo, 2017).

Like traditional banking, microfinance institutions in some countries have two systems that are principally different, Islamic and conventional lending. The differences between the two systems is that “...in Islamic banking, money cannot be treated as a commodity. Money must be used productively (like labour or land), with the return based solely on actual profit or loss. The bank and the entrepreneur share the risk of a project.” (Ledgerwood, 1998 pp. 42). For example Indonesia, the microfinance institution regulation adopts this dual system. The number of Islamic microfinance institutions in Indonesia is not as many as conventional microfinance, around 35% of total microfinance institutions with total assets of more than Rp450 billion (data from www.ojk.go.id, 1st quarter of 2020). It is lower than conventional microfinance assets of more than Rp600 billion.

According to Alam, Gupta, & Shanmugam, (2017), there are six main principles of Islamic banking: 1) Interest rates (*Riba*) are prohibited and haram (not permitted); 2) Contract between the bank and the clients is equity-based rather than debt-based transaction. The bank invests the money into the client’s project. The project risk is shared between the bank and the clients; 3) Money is considered only as medium of exchange to value goods. Therefore, interest rates are not allowed. Therefore, the money prices (interest rates) are prohibited; 4) Some activities characterized by extreme uncertainty (*gharar* and *maysir*) are prohibited under sharia’s law. These activities cannot be financed by Islamic banks; 5) Since not all activities can be financed by Islamic banks, all the banks must have Syariah Supervisory Board that provide advices on which activities that a

bank can finance; and 6) to reduce information gap and moral hazards, the banks have a sacred duty to uphold the contractual obligation and to disclose all information.

As financial intermediaries like banks, Islamic microfinance institutions offer lending products beside receiving deposits. There are many types of financing products that an Islamic bank can offer. These products must comply with Syariah law on exchange contracts (Habib, 2018). Some examples of Syariah products can be briefly explained as follows: 1) Murabaha is a contract where the bank sells item(s) with mark-up price and for future payment. Both parties know and agree with the mark-up price; 2) Salam is a contract where the bank receive advanced payment for an item with a full price but it will be delivered in the future; and 3) Istisna is a contract where the bank finances a development of capital asset such as building or machinery. The payment is made during the construction or after the project completion.

In the past, the main financial policy adopted by most developing countries to eradicate poverty in rural areas was based on direct intervention, whereby credit and subsidised low interest rates were provided to poor people (Adams, Graham, & Von Pischke, 1984; Steel & Charitonenko, 2003). However, many subsidised credit programs experienced failure in the 1960s and 1970s (Louis, Seret, & Baesens, 2013; Morduch, 2000). The failure was caused by problems such as high default rates, inefficiency in allocation, corruption and mis-targeting the poor (Adams et al., 1984; Braverman & Guasch, 1986). The credit programs were unsustainable and required continuous government or donor support (Hoff & Stiglitz, 1990).

The movement towards free markets and the liberalisation of financial sectors, promoted by major international agencies in the Washington Consensus, has contributed to changes in the old paradigm of poverty eradication efforts (Johnson, 2009). The financial sector reform involves measures such as reduction in government directed credit programs, reduction in subsidies on interest rates, and eliminating the interest rate ceiling (World Bank, 1989). Government subsidies on credit and interest rates can induce political intervention, poor loan enforcement, and hindrance to deposit mobilisation (Hoff, Braverman, & Stiglitz, 1993). Therefore, it was suggested that microfinance goals should be achieved through a “financial systems” approach (Ledgerwood, 1998). The approach was also known as the *institutionist* approach (Brau & Woller, 2004; Conning, 1999; Gutierrez-Nieto, Serrano-Cinca, & Molinero, 2009). It requires financially self-sustainable microfinance institutions that are independent of subsidies. According to Conning (1999), the argument for “self-sustainable” or subsidy-independent microfinance is that higher interest revenues and cost efficiency result in higher profit for microfinance. This can attract private company investments that increase the capacity of microfinance

institutions to broaden outreach. Rising interest rates would not affect the demand for micro credits by the poor, since the demand is inelastic to interest rates changes (Kar & Swain, 2014). What the poor need is greater access to credit rather than cheaper credit (Robinson, 1995). Subsidies would discourage microfinance from mobilising deposits, thus limiting the ability of microfinance institutions to scale up outreach (Morduch, 2000). Demand for micro credits from the poor is huge and it may be able to be supplied by commercial firms as well as by donor or government funded credit programs (Robinson, 1995). The demand can be fulfilled by self-sufficient commercial microfinance institutions that can mobilise deposits and attract private investors (Robinson, 1995).

Meanwhile, the *welfarist* opponents of the *institutionists* contend that this approach will exclude the poorest from access to microfinance (Conning, 1999). High interest rates would not be affordable for the poorest, since the loan may be used for consumption instead of productive activities (Morduch, 2000; Robinson, 1995). Under the *welfarist* approach, subsidies are needed to make the loans affordable for the poorest (Robinson, 1995). While *institutionists* focus on the scale of outreach, *welfarists* put more emphasis on the depth of outreach, prioritising affordable credit to the poorest of the poor (Brau & Woller, 2004). Furthermore, *welfarists* believe that low income people might not have sufficient income for saving, so deposit mobilisation would be infeasible (Robinson, 1995). Microfinance should rely on subsidies and donor assistance for the credit funding.

Outreach in the context of a microfinance institution is defined as:

...the effort by MFOs [(microfinance organizations)] to extend loans and financial services to an ever-wider audience (breadth of outreach) and especially toward the poorest of the poor (depth of outreach). (Conning, 1999, p. 52)

...the number of clients served by an entity. It can be measured using average loan size and percentage of women borrowers that measures depth of outreach, and average length of client relationships and time between instalment payments as a measure of length and scope of outreach. (Semaw Henock, 2019)

González Vega (1998), Yaron (1994) and Schreiner (2002) propose six dimensions of microfinance outreach:

1. Quality: the value of product that microfinance offers.

2. Costs: the amount spent to obtain the service including interest costs and transaction costs.
3. Depth: the poverty level of clients that microfinance serves.
4. Breadth: the number of microfinance poor clients.
5. Length: the continuity of financial service that microfinance provides.
6. Variety/scope: the number of products that microfinance provides.

Most studies have used depth of outreach as a measurement for microfinance outreach performance (such as Hossain, Galbreath, Hasan, & Randøy, 2020; Meyer, 2019; Saad, Taib, & Bhuiyan, 2019; Semaw Henock, 2019). The depth of outreach is frequently measured by the poverty level of the borrowers and the number of female borrowers. Female gender is an important indicator of the outreach because credits from microfinance can help empower women. Moser (as cited in Sanyal, 2009), refers to women's empowerment as "... women's capacity to increase self-reliance, their right to determine choices, and their ability to influence the direction of change by gaining control over material and nonmaterial resources." Meanwhile, poverty level was predominantly proxied by the size of the loan (Morduch, 2000; Schreiner, 2002). Richer borrowers tend to take out bigger loans (Morduch, Hashemi, & Littlefield, 2003). Wealthier borrowers are not interested in small loans (Steel & Charitonenko, 2003). Although poverty level could be better measured by considering borrower income, data on income is not available from an accessible microfinance database such as the MIX Market (Quayes, 2015).

Sustainability in the context of microfinance is defined as:

...lender's capacity to operate for a considerable period of time, measured in decades, independently of subsidy or altruistic support. (Von Pischke, 1996, p. 227)

...full cost recovery or profit making and is associated with the aim of building microfinance institutions that can last into the future without continued reliance on government subsidies or donor funds. (Conning, 1999, p.52)

At present, a large number of microfinance programmes still depend on donor subsidies to meet the high costs, i.e. they are not financially sustainable. (Hermes & Lensink, 2007, p. F6)

Sustainability of microfinance institutions is defined as the long-term continuity of the microfinance programme, which involves

continuation of financial and nonfinancial services of microfinance institutions. (Thomas & Kumar, 2016, p. 41)

The definitions of microfinance sustainability and depth of outreach have been adopted in various studies (such as Gutierrez-Goiria, et al. 2017; Mia, & Chandran, 2016; Sheremenko, et al. 2017; Seibel., et al. 2010; Widiarto & Emrouznejad, 2015; & Wijesiri, et al., 2015). These definitions are compatible with the current Indonesian microfinance policies. The current Indonesian policies emphasizes on independency of the microfinance on government supports. Many government programs that provide loans to small businesses and the poor are encouraged to transformed into self-sufficient institutions such as PUAP programs that are also discussed in the present study. Furthermore, the definition of depth of outreach agrees with the objective of microfinance institution as stated in the current Indonesian microfinance law. Although female borrowers have not yet been explicitly stated as a primary target of microfinance lending in the current law, it mentions about the main objective of microfinance institution to help economic improvement of small businesses and the poor. Future amendment of the law may need to include female borrowers as a primary target of microfinance lending.

According to the definitions, the sustainability of microfinance has been associated with continuity or going concern of the institution without dependency on government subsidies or fund from donors. The microfinance needs to be oriented toward profit making, which can be achieved by increasing the revenues to cover the operating expenses. Meanwhile, microfinance outreach has been frequently associated with the depth of outreach which is commonly measured by how poor the clients are, and the number of women clients. The present research adapted these definition of microfinance sustainability and depth of outreach. Sustainable microfinance is when it can generate bigger interest revenues from the lending activities and maintain low rates of non-performing loans. On the other side, microfinance is able to achieve depth outreach when it serves many women and the poorest of the poor.

1.2 Research problems

The two competing approaches, welfarist and institutionist, have sparked a debate on how microfinance should achieve the poverty alleviation goal. The welfarist believes that subsidies and donor assistance are necessary to attain deeper outreach to the poorest of the poor and more women borrowers. Whereas, the institutionist believes that continuous access to loans can be broadened to more poor people if microfinance is sustainable and self-sufficient and not reliant on subsidies or donors' funding. Self-sufficiency can be achieved by turning into a profit-oriented organisation that is able to

generate sufficient income to cover its operational costs without relying on the subsidies or the donor. However, this has raised the question of whether the institutionist approach can achieve the same depth of outreach as the welfarist approach without risking the sustainability. There may be a trade-off between depth of outreach and sustainability. When the focus is on sustainability, microfinance needs to find borrowers who are able to pay higher interest rates and have lower credit risk. This category of borrowers may not be those who are targeted by the welfarist that have been focusing on the depth of outreach. The present dissertation sets out to investigate the issues of relationship between depth of outreach and sustainability of lending in Indonesian microfinance institutions.

Although many researchers have been investigating the trade-offs between outreach and sustainability, the results are still inconclusive. The previous empirical studies can be grouped into three categories. First, some studies found no statistical evidence of relationship between depth of outreach and sustainability. As indicated in the previous section, independence on subsidy is one of the important indicators of microfinance sustainability. Paxton (2003) found that subsidies are not correlated with microfinance outreach in 18 microfinance institutions from two world regions. Here, outreach is measured by a poverty outreach index that combines both depth and breadth of outreach. The result implies that subsidies may not affect the microfinance ability to reach out the poor. Even without subsidies, the microfinance may still be able to provide loans to the poor. Similarly, a cross countries analysis of Al-Azzam (2019) analyses the effects of subsidies and deposit mobilisation on depth of outreach and sustainability. The study found that microfinance can provide loans to the poor with reasonable interest rates by sourcing the funding with either subsidies or deposit source of funding. The findings indicate the effect of both types of funding on microfinance outreach and sustainability are similar except for repayment rates where subsidies are associated with lower repayment rates while there is no evidence of association between deposit mobilisation and the repayment rates. Moreover, profit-orientation characterises a sustainable microfinance organisation. To be sustainable and independent on subsidies or donors, microfinance needs to orient toward profit. A study of Kar (2013) investigated the effects of microfinance profitability on depth of outreach using panel data on 409 microfinance institutions in 71 countries. The study found no evidence of trade-off between profit-motivation and the depth of outreach. However, this study found some extent of trade-off in terms of relationship between loan size as proxy for depth of outreach and the microfinance size. Larger microfinance tends to lend bigger loans or shallow depth of outreach. In terms of gender, larger microfinance institutions are

associated with a smaller proportion of female borrowers. Both indicators of depth outreach indicate a trade-off.

The second group of studies have identified some evidence of the trade-off in microfinance of many countries in several world regions. The trade-off occurs when depth of outreach has adverse effects on various financial sustainability indicators. For example, Churchill (2018) investigated the existence of a trade-off between microfinance depth of outreach and sustainability, on 206 microfinance institutions from 33 countries in Africa. The study used number of women and size of loans as measures of depth of outreach. That study found a trade-off between depth of outreach and sustainability. Loan sizes were positively correlated with the microfinance financial performance. Targeting the poorer applicants with smaller loans was associated with lower financial performance. Likewise, financial performance was negatively correlated with the proportion of women borrowers. Microfinance targeting more women borrowers had a higher likelihood of having poorer financial performance. This trade-off is stronger in profit-oriented microfinance than non-profit oriented microfinance. A more recent study by Awaworyi Churchill (2019) with a larger dataset of 1595 microfinance in 109 countries shows a consistent result with his previous finding. In the study, two types of outreach were used in the analysis including depth of outreach index (DOI) and breadth of outreach index (BOI). The DOI was constructed using two indicators of depth of outreach (loan sizes and percentage of female borrowers). Using a three-stage least square (3SLS) regression approach, it was found that there was a strong negative correlation between the DOI and financial sustainability.

In contrast, the third group of studies has found empirical evidence that deeper outreach has favourable impact on microfinance sustainability. These studies may support the idea that lending to poor people in order to fight poverty can be conducted by commercial organisations that are independent of government or donor funding supports. For example, Quayes (2015) analysed panel data of 764 microfinance institutions in several world regions from 2003 to 2006 using three types of panel data regression. Generally, the study found a negative correlation between average loan sizes and three measures of sustainability, including profitability margin, ROA and operational self-sufficiency. This suggests that there would be no adverse financial impact when microfinance provides small loans to poor clients. Profitability and self-sufficiency improve with the decrease of loan sizes. The results particularly hold true for microfinance with higher level accountability in terms of disclosure. Additionally, Churchill and Marr (2017) compare the depth of outreach and sustainability relationship between microfinance in Latin American Countries (LAC) and South Asia (SA) comprising 215 institutions within the period of

2005 to 2012. It was found that trade-off occurs in both regions where higher profit or return on asset are associated with larger loans. In other words, small scale lending could decline the microfinance profitability. In terms of lending to women, the trade-off was only found in LAC where percentage of females was negatively correlated with profit margin and return on asset. This could imply that microfinance lending to women borrowers has a higher likelihood of lower profitability. Meanwhile, the opposite correlation has been found in the SA region where percentage of females is positively correlated with profitability ratios.

Information asymmetry has been widely exploited to explain why small scale lending of microfinance may be riskier than traditional bank lending. The asymmetry of information between lender and borrower might lead to expensive and unsustainable lending. The microfinance might have to choose between two difficult options, lending to a poorer borrower to achieve the social objective but taking a higher risk or lending to the wealthier to avoid the risk but neglecting the social goal. The marginal costs of information acquisition can be different between individuals (Nicholson, 2002). This differences can cause an unbalanced amount of information possession between market actors and eventually create market failure in allocating resources in the credit market efficiently. Adverse selection and moral hazard are two common problems in a credit market with imperfect information. Price cannot clear the market and the lender prefers rationing the borrower to increasing the interest rates (Stiglitz & Weiss, 1981).

Lenders can use two types of mechanisms (direct and indirect) to overcome these informational problems (Hoff & Stiglitz, 1990). A direct mechanism is where lenders spend resources to select, monitor and enforce credits. This mechanism requires more cost allocation for the lenders. It may suggest that the costs might be transferred to the borrower and would make the lending rates expensive for poor borrowers. On the other hand, an indirect mechanism exploits contract design, such as loan terms, for screening and incentive devices purposes. Collateral and interest rates are two common elements of loan terms used for this purposes. However, not many poor borrowers own tangible assets for loan collateral, especially for women in countries like Indonesia, where family assets tend to be controlled by men. This situation may impede access to loans or create higher exposure to risk for the lenders. Likewise, charging high loan interest rates to induce an indirect mechanism can cause an unfavourable outcome to the lenders (Stiglitz & Weiss, 1981). The marginal expected rate of return for the lender is declining when interest rates reach a certain level that can induce adverse selection and moral hazard.

Some theories about joint liability group lending methodology have been suggested to correct the problems of information asymmetry. There are three important instruments in group lending that can help lenders to minimise the adverse selection and moral hazard problems. These instruments are self-imposed by the group members through the jointly liability. It includes peer monitoring (de Aghion, 1999; Islam, 1996; Stiglitz, 1990), peer selection (de Aghion & Gollier, 2000; Giné & Karlan, 2014; Varian, 1990), and peer pressure (Al-Azzam, Carter Hill, & Sarangi, 2012; Besley & Coate, 1995; van Bastelaer & Leathers, 2006).

Although many empirical studies have investigated the role of lending methodology, the results are mixed and have not been conclusive. Some evidence has been found that joint liability can help microfinance to improve loan repayment even without the presence of collateral. For example, evidence from microfinance in Georgia has shown that although individual liability loans rely heavily on collateral, an intensive process of selection and screening of borrowers is still critical to realise high repayment rates (Vigenina & Kritikos, 2004). In contrast, joint liability lending was found to be an ideal collateral substitute to secure high repayment rates. It imposes a peer process to induce higher repayment.

Further evidence was found from a field experiment that was conducted on 256 borrowers of microfinance in Thailand (Jarungrattanapong, 2018). The experiment conducted a microfinance game. One of the experiment objectives was to compare loan repayment rates between joint liability, individual liability and dynamic incentives. An important finding of the study is that joint liability loans without dynamic incentives are associated with lower default rates than individual liability loans. The study also found that risk-taking investment decision of borrowers in both individual and group lending can be minimised by enforcing dynamic incentives to the lending.

There is also evidence from a laboratory experiment in two universities in Australia and one university in India (Cason, Gangadharan, & Maitra, 2012). The participants were randomly assigned to group and individual lending treatments. One of the important objectives of this experiment was to compare the benefits of group and individual lending. The experiment revealed that repayment rates for group lending with peer monitoring were higher than individual lending with lender monitoring. This is valid if the peer monitoring costs are lower than lender monitoring costs. If the costs are indifferent, there is no significant difference of repayment rates between individual and group lending.

Evidence from Kenyan microfinance also revealed that repayment rates of group lending are higher than individual lending (Kodongo & Kendi, 2013). Using data of 420 clients

from 38 microfinance institutions in Kenya, the study compared loan performance of individual and group lending. It found evidence that group lending outperformed individual lending in terms of repayment. Since it was also found that individual loans were charged higher interest rates and default rates than group lending, the study recommends that group lending is prioritised for borrowers who have never taken up loans previously. Borrowers who have good performance in group lending are then allowed to take individual loans.

In contrast, some studies found no empirical evidence of significance difference in repayment rates between group and individual lending. For example, a field experiment was conducted in Mongolia to observe the impact of lending method on borrower behaviour (Attanasio, Augsburg, De Haas, Fitzsimons, & Harmgart, 2014). The experiment found that although group lending increased household consumption and entrepreneurship, it had no significant differences of effects on default probability as compared to individual lending. Another experiment was conducted in the Philippines to observe the effects of different types of lending liability on the default rates (Giné & Karlan, 2014). The field experiment was carried out in two different areas. In the first area, pre-existing group loans were transformed into individual lending. The effects of removing the joint liability were then evaluated. Whereas, new trial loans with two types of lending liability were created in the second area. The performance of both types of loans were then compared and evaluated. This experiment revealed that the default did not increase in the first area. The change from joint to individual liability did not make a significant difference to the default rates. Similarly, there was no significant change in default rates within two years in the second area.

Beside the potential effects of lending methods on the loan repayment, it may also have influences on the relationship between outreach and sustainability (Huq, Azad, Masum, Wanke, & Rahman, 2017). A theoretical model of Caserta, Monteleone, and Reito (2018) predicts an optimum contract for-profit and not-for-profit microfinance under moral hazard circumstances. The model predicts that the optimum equilibrium contract for for-profit microfinance is when microfinance offers both individual and group lending methods to the clients. If only one lending method is offered, microfinance may face a trade-off between outreach and sustainability. Whereas, for not-for-profit microfinance, the trade-off does not occur even when only one type of lending method is offered to the clients.

To sum up, the literature has shown that trade-off between depth of outreach and sustainability has become a main concern of microfinance. There are different views on how microfinance should approach the poverty alleviation goal. While the welfarist's view

focuses on the depth of outreach and relies on subsidies for the funding, the institutionist puts more emphasis on the sustainability and self-sufficiency of the microfinance to reach a larger number of poor people. Some believe that depth of outreach cannot be attained if microfinance also focuses on sustainability. Does the microfinance have to choose either targeting maximum depth of outreach with reliance on financial support from government and donors, or focusing on independency in financing but targeting larger and wealthier clients? Does the trade-off exist? Although many researchers have been investigating the trade-offs between outreach and sustainability, the results are still inconclusive. A large gap of information asymmetry between lender and borrower in the market has been attributed to the trade-off problem. Standard measures for correcting the informational problems such as collateral and interest rates may not be applicable in this market where the collateral is lacking and the borrower income is too low to afford high interest rates. Although still inconclusive, some studies found a potential solution for the problem which is the use of appropriate lending methods to minimise the informational problems. Group lending has special tools such as peer monitoring, peer selection and peer pressure, which can possibly be used to reduce the problems caused by information asymmetry. The present thesis pursues this idea further by conducting an empirical study in Indonesian microfinance.

The significance of the difference in outreach and sustainability indicators across countries needs to be considered carefully (Kar, 2013). For example, microfinance in each country may have different types of competitors, differences in organisation characteristics, and differences in business objectives. All of these dissimilarities could influence the average loan sizes. Moreover, the level of income per capita in every country is different, which can affect how to interpret the average loan size in a cross-countries analysis (Quayes, 2015). The particular amount of average loan size in country A might be considered small relative to its per capita income. However, that amount might be considered large in country B relative to the per capita income in this country. Therefore, the result of cross-countries analysis in relation to loan size needs to be interpreted carefully. Normalisation of the average loan size with per capita income was commonly used, as in Quayes (2015). Despite the limitation of cross-countries analysis, a large number of studies have used a dataset at the institution level and adopted cross-countries analysis (such as Churchill, 2018; Churchill & Marr, 2017; Quayes, 2015), with the results showing that different regions have a different relationship between outreach and sustainability. Further investigation on the topic in a specific country may need to be pursued to gain better knowledge on the relationship between depth of outreach and sustainability.

The present study investigated depth of outreach and sustainability specifically in the Indonesian context. Instead of using data at institutional level as in previous studies, this study made use of data on individual loans that have provided a more accurate proxy of individual borrower income than the average loan size at institution level. Besides, this study also examined the importance of lending methods on the relationship. To the researcher's knowledge, the present research is the first study investigating the effect of lending method on the relationship between outreach and sustainability in the Indonesian context. The significance of Indonesia as a location of this study is based on two main reasons: (1) Indonesian microfinance has just begun a new system of regulation and commercialisation since 2013. The microfinance is regulated with financial regulation. Many of the government's subsidised programs were encouraged to transform into regulated self-sufficient financial institutions; and (2) Poverty eradication is significantly relevant to the Indonesian context where there are around 25 million people (about 10% of the Indonesian population) living below the poverty line (source: World Bank Indonesia). Microfinance can have a role in helping the poor out of poverty by providing credits for income generating activities. Microfinance institutions are expected to not shift their mission from the social objective.

1.3 Research gaps and questions

There is a gap in the literature focusing on outreach, sustainability and loan methodology that the current research intends to partly cover:

1. Literature on the existence of trade-off between microfinance outreach and sustainability is still inconclusive. It needs further investigation into the existence and nature of the trade-off.
2. Most studies on the trade-off are across countries and at institutional level. Studies on the trade-off in a specific country and at loan level are still rare. Specifically, little is known about the trade-off in the Indonesian context.
3. There are numerous studies on the effect of lending methodology on depth of outreach and on sustainability. However, there is a lack of studies on the effects of different lending methodologies on the relationship between depth of outreach and sustainability.

The current study is organised specifically around the following research questions:

1. What is the nature of lending methodology in Indonesian microfinance institutions in Central Java province and what are the driving factors that shape the lending methodology?

2. To what extent did the adoption of a particular lending methodology affect the relationship between depth of outreach and sustainability of Indonesian microfinance institutions in Central Java province?

1.4 Research aims and objectives

The current research aims at investigating the relationship and nature of relationship between lending methodology, microfinance depth of outreach and sustainability. The investigation was conducted on Indonesian microfinance institutions.

Specifically, the present research attempts to achieve the following objectives:

1. To understand the existing lending methodology of the microfinance institutions, with specific reference to lending to individuals and groups.
2. To compare the relationship between depth of outreach and sustainability for all lending, and for individual lending and group lending separately.
3. To examine: i) the association between gender and loan size; ii) the association between lending methodology and loan size; and iii) the relationship between borrower income and loan size.
4. To undertake a preliminary assessment of what adjustments may be needed to lending regulations and to government policy to achieve a better balance of social outreach and financial sustainability in Indonesian microfinance.

1.5 Research design and methodology

The present study adopted a mixed methodology that joins components of qualitative and quantitative research approaches (Creswell, 2009; Johnson & Onwuegbuzie, 2007). The qualitative method is used to help explain the results of the quantitative method. This approach was appropriate to attain the objectives of this research by making use of two data sources:

1. Semi-structured interviews with the sample microfinance institutions.
2. Borrower level data of loans from the sample microfinance institutions.

Interviews were conducted with managers of microfinance institutions in different locations of Central Java province, Indonesia. The selection of microfinance institutions was done by a combination of stratified methods and convenience sampling where the microfinance institutions were grouped based on two lending methods: individual and group. Convenience sampling was carried out in each of these categories. There were 20 microfinance institutions who were available to be interviewed due to time and cost

considerations, where most microfinance institutions are remotely located. Analysis of the interview data was carried out thematically.

Quantitative data on loans was obtained from microfinance institutions visited during the interviews. Data could only be collected from 14 microfinance institutions with a total of 2,278 observations. Two statistical models are used to examine the relationship of lending outreach and sustainability, the Probit model and simple multiple regression with ordinary least square (OLS) method.

1.6 Empirical and policy contribution

Although the questions surrounding lending methodology, outreach, and sustainability in the microfinance sector have not been adequately answered in the literature, this topic keeps on challenging consensus on the trade-off between outreach and sustainability. It also continues to challenge the effectiveness of group lending methodology in mitigating credit risks and in improving lending performance. The expected contribution that this study makes to the literature is empirical evidence on:

1. The lending methodology of Indonesian microfinance institutions.
2. The relationship between microfinance depth of outreach and sustainability.
3. Lending methodology differences in relation to: i) interest rates; ii) loan amount; and iii) loan repayment.
4. Gender differences in relation to: i) lending interest rates; ii) loan amount; iii) loan repayment; and iv) lending methodology.
5. The relationship between loan interest rates and loan repayment performance.

In addition, this research can be useful for microfinance institutions to provide an alternative strategy to achieve financial and social goals of microfinance. Specifically, microfinance institutions need an appropriate strategy to mitigate the credit risk and at the same time to maintain sustainable lending to low income people and small businesses.

From the policy maker perspective, the research is expected to give suggestions on regulatory support for achieving the expected financial and social goals of microfinance. This can be achieved by improving the current regulation that has been applied since 2013.

1.7 Thesis structure

This thesis consists of eight chapters and this section provides a brief overview of each chapter:

Chapter 1 is the thesis introductory chapter that outlines research problems, gaps, aims and objectives, design and methodology, and its empirical and policy contribution.

Chapter 2 is a description of the development of Indonesian microfinance chronologically to contextualise this study. The second part of the chapter explains current regulation on microfinance institutions in Indonesia.

Chapter 3 is a review of literature on microfinance, emphasising the concept of imperfect information in the credit market, lending methodology, previous studies on sustainability and outreach trade-off, gender in microfinance, and the proposed conceptual framework.

Chapter 4 presents the theoretical framework, research paradigm and research design. Mixed methodology is chosen for this study, which triangulates qualitative and quantitative analysis. The detailed procedures of the quantitative and qualitative methods are also outlined and followed by highlights on ethical issues of this research.

Chapter 5 provides descriptive statistics of microfinance loan data collected in the Central Java province of Indonesia. The description is presented in tables, graphs, and figures. It describes microfinance lending outreach, sustainability and the borrower demography.

Chapter 6 presents the thematic analysis of qualitative data from face to face interviews with the managers of MFIs. The analysis process utilised QSR NVIVO 12.

Chapter 7 outlines statistical analysis of quantitative data using IBM SPSS Statistics 25. The link between lending outreach and lending sustainability is tested. This analysis is to: 1) compare the relationship of outreach and interest rates between individual lending and group lending; 2) compare the relationship of outreach and loan collectability between individual lending and group lending; and 3) examine the relationship between loan sizes and three main variables including gender, lending methods and borrower income.

Chapter 8 triangulates the qualitative and quantitative results that give insight into the relationship between lending outreach and sustainability of microfinance. It presents the research limitations, future research suggestions, and the research's empirical and practical contribution.

CHAPTER 2 THE DEVELOPMENT AND REGULATION OF INDONESIAN MICROFINANCE INSTITUTIONS

2.1 Introduction

This chapter outlines the development and the current regulation of Indonesian microfinance institutions. There is an extensive literature on the history of microfinance in Indonesia (such as Arsyad, 2005; Berenbach, 1997; Robinson & Fidler, 2002). The present chapter does not seek to give a detailed account of this history in its entirety. Instead, the chapter provides historical context for the study's analysis of recent developments in Indonesian microfinance. The chapter emphasises, in particular, the need to fill gaps in the existing literature regarding developments that post-date the enactment of the Microfinance Institution Act in 2015.

The first part of the chapter is divided into three chronologically ordered subsections. The first subsection concerns the history of microfinance before Indonesia's independence in 1945, including the period of the Dutch occupation, up to 1942, and then Japan's occupation until the end of World War II. The second subsection reviews the history of microfinance in the early days of independence under President Soekarno, who led the country from 1945 to 1967. The third subsection begins with the New Order period, so named by President Suharto, the second post-independence leader, and continues through the period of the Reformation that began with Suharto's resignation in 1998. This subsection concludes with the enactment of the Microfinance Institution Act in 2013.

The second part of this chapter then turns to the current regulation of microfinance institutions in Indonesia. The regulation, providing a legal framework for microfinance, specifies rules for ensuring the soundness of microfinance operations. The last part is the chapter summary.

2.2 Indonesian microfinance institutions: A brief history

2.2.1 Microfinance during Indonesia's pre-independence period

Raden Aria Wirjaatmadja is known as one of the pioneers of microfinance in Indonesia. He was a government official in the regency of Purwokerto, Central Java province, who helped establish a financial institution in 1895 to assist local government employees who were indebted to loan sharks (Schmit, 1994). Taking large loans from loan sharks was common in local communities that needed funds to hold *selamatan* events, or thanksgiving celebrations that are a part of Javanese religious rituals. Raden Aria wanted

to free local government employees from the loan sharks and to foster brotherhood and unity of rural community (Arsyad, 2005; Schmit, 1994).

A Dutch administrator at the time, E. Sieburgh, put Raden Aria's idea into practice by establishing a bank. Sieburgh helped fund this bank by collecting funds from Europeans as well as local residents in the Purwokerto regency. The bank was named *Hulp en Spaarbank der Inlandsche Bestuurs Amtenaren*, or *Priyayi Bank*. Sieburgh was later replaced by De Wolff van Westerrode, who was a strong supporter of the concept of cooperative financing (Arsyad, 2005). In 1897, van Westerrode began transforming the organisation into a cooperative and changed the bank's name to *Poerwokertosche Hulp, Spaar en Landbouwcredietbank*, leading to the establishment of many similar institutions in other regions in Java. Not all of these institutions were cooperative, however; indeed, most of the cooperatives did not last long and eventually collapsed (Schmit, 1994). Schmit argued that their failure was due to an inappropriate bank policy at the time, as well as a lack of enthusiasm on the part of the colonial administrators and the managers of the cooperative institutions themselves. The management favoured a more traditional banking system over cooperatives.

Then, starting in 1902, the village bank system began to develop; this system took forms similar to the cooperatives, including *lumbung padi* (granaries used to store and dry harvested rice) banks and village banks (Schmit, 1994). The banks were developed, initially, in the areas of Java and Madura, and management of the banks was carried out by village administrators. The Dutch government legally recognised the banks by issuing Staatsblad No. 357 in the 1929 Village Credit Institution Act. These village banks still operate today, and are known as Village Credit Institutions, or *Badan Kredit Desa* (BKD).

The Dutch government also developed banks offering credit to the local population in several regions in Java (Berenbach, 1997). Subsidised by the government, these banks are known as "people's banks" (*Volksbank*). These banks, too, continue to operate in various regions in Indonesia, under the name of the People's Credit Bank (*Bank Perkreditan Rakyat*).

In 1912 two new Institutions were established: namely, a Popular Credit System (the *Volkscredietwezen*), and a Central Fund (Berenbach, 1997). These institutions were aimed at supporting, and overseeing, all the local banks operating in villages, including *lumbung padi* banks, village banks, and popular credit banks. Banks under the Popular Credit System adopted cooperative principles considered by the overseers to be the most suitable for rural people in Indonesia.

In 1934, the Dutch government established the *Algemene Volkscredietbank* (*People's General Credit Bank*), or AVB (Arsyad, 2005). This bank was established by a decree of General Governor No. 20 (Staatsblad No. 82). Thomas A. Fruin was the first president of AVB (Robinson & Fidler, 2002), which provided a source of funding for village banks and *lumbung padi* banks. AVB also served as a place to deposit surplus funds owned by the local banks.

2.2.2 Indonesian microfinance, 1945-1966

After Indonesian independence in 1945, the government's general policy was to nationalise foreign-owned financial institutions (Arsyad, 2005; Cole, Cole, & Slade, 1999). Through this policy, the People's Credit Bank became *Bank Rakyat Indonesia* (BRI) in 1946 (Berenbach, 1997). Four years later BRI merged with AVB and became a state-owned bank, which was given the responsibility of extending credit in rural areas to farmers and small businesses. As a result of this merger, BRI/AVB became the bank with the largest number of clients and the most branches in Indonesia (Berenbach, 1997).

Many BKDs were transformed into different credit institutions after the merger of BRI and AVB (Baskara, 2014). For example, the BKD in West Java became *Lembaga Perkreditan Kecamatan* (LPK), or the Subdistrict Credit Institution; in Central Java, it became *Badan Kredit Kecamatan* (BKK), or the Subdistrict Credit Agency. Meanwhile, the BKD in East Java became *Kredit Usaha Rakyat Kecil* (KURK), or Small People's Business Credit; in Bali, it became the *Lembaga Perkreditan Desa* (LPD), or Village Credit Institutions; and in West Sumatra, it became the *Lumbung Pitih Nagari* (LPN). The LPD and the LPN are different from the other transformed institutions, because these two institutions adopted local customary rules in the framework used for credit provision.

During Soekarno's tenure as president, funding for government expenditures came through the printing of money by the Central Bank, causing hyperinflation of more than 600% and a decrease in the ratio of real money supply to GDP (Cole et al., 1999). President Soekarno initiated a three-year program to offset deficits in the domestic rice supply (Berenbach, 1997). However, this program was unsuccessful due to technical and logistical constraints, weak planning, and poor repayment rates for government loans. Sukarno, the second post-independence president, likewise undertook a program of rice intensification, but it, too, was unsuccessful. The resulting economic crisis accompanied by domestic political upheaval gave rise to the Reformation movement and a new government led by President Soeharto (Lapenu, 1998).

2.2.3 Microfinance in Indonesia in the post-Soekarno era

In 1967, the Indonesian government issued Act No. 14 on Banking Principles. The enactment of this law did not repeal Staatsblad No. 357, which had been issued in 1929 by the Dutch government and which regulated rural credit agencies in Java and Madura. Village banks, village *lumbungs padi* banks, market banks, employees' banks, and other rural banks that had been established before the Act could still conduct business.

With the failure of the rice-intensification program, Suharto launched the *Bimbingan Masyarakat* (BIMAS) or Mass Guidance program in 1968 (Berenbach, 1997). Through this program, the government provided subsidised loans to farmers to buy material inputs for rice cultivation. Farmers' land was planted with rice according to specifications set out by the government. This program was funded through contracts with foreign companies. However, the BIMAS program ultimately failed due to corruption, low crop yields, and low loan-repayment rates.

In 1970, the Soeharto government terminated the BIMAS program contracts with foreign companies and began to oversee the program (Berenbach, 1997). A year earlier, a pilot project for the new BIMAS credit program had been carried out with the assistance of the BRI office in Yogyakarta province. This pilot project was made possible through collaboration with the Food and Agriculture Organization; it was led by Klaas Kuiper as the project manager and adopted the ideas of Fruin and the AVB approach.

In 1973, the government issued Presidential Instruction No. 4 to establish the administrative framework of the Village Unit, which was designed to increase national rice production and improve the economic welfare of farmers and village communities. Originally, the Village Unit had multiple functions, including agricultural extension, credit distribution, distribution of production facilities, processing, and marketing. Each Village Unit had an operational area of one or more villages in one sub-district. The Village Unit's functions were carried out by business entities in the form of cooperatives; hence they were known as *Koperasi Unit Desa* (KUD), or Village Unit Cooperatives. The lending function was carried out by BRI banks. These banks not only extended credit but also mobilised public savings. The BRI office in the village that is part of a Village Unit is still referred to as the "BRI village unit." By 1983, BRI had succeeded in developing 3,626 such units throughout Indonesia (Berenbach, 1997). The risk of default was borne by three parties: the BRI Bank, the Ministry of Finance, and the Central Bank.

The BIMAS program could not achieve its goal of assisting low-income farmers and increasing rice production (Berenbach, 1997). The failure was caused by several factors. BIMAS's borrower selection program was carried out by a committee consisting of

representatives from the Ministry of Agriculture as well as local village officials. As such, the BRI village unit had little involvement in the process, despite being fully responsible for loan disbursements.

Another problem that caused difficulties for farmers was the loan-repayment timeframe. The due date for BIMAS credit repayment was shortly after the harvest, at a time when the selling price of rice was usually falling due to the abundant supply. Farmers had no other option than to sell their crops at low prices in order to repay loans to BRI village units.

These problems caused a low loan-repayment rate and decreasing participation of farmers in the BIMAS program (Berenbach, 1997). The average loan-repayment rate was only 57% from 1976 to 1984. The number of farmers participating in the BIMAS program fell by 15% during this same period, and the area of land served by the BIMAS program fell by 12%. The BIMAS program was officially terminated in 1985.

After 1983, the BRI Bank started shifting from the BIMAS program to a commercial rural lending program called the *Kredit Umum Pedesaan* (KUPEDES), or general village credit. This credit provision was carried out by the BRI village unit and had millions of dollars of outstanding credits and millions of borrowers (Arsyad, 2005; Baskara, 2014).

In addition to the BIMAS program, the government also developed various financial institutions in rural areas. In the early 1970s, the government relaxed the regulations for establishing the BPR, so that the number of BPR banks operating in Indonesia increased to around 300 (Baskara, 2014).

The government categorised credit institutions originating from BKD transformations in various regions as *Lembaga Dana dan Kredit Pedesaan* (LDKP), or Rural Fund and Credit Institutions. LDKPs were recognised as financial institutions under the legal system for banking in Indonesia, which was regulated by Act No. 14, issued in 1967. Although their status as financial institutions was recognised by this Act, LDKPs were not as flexible as other types of banks (Baskara, 2014). In particular, LDKPs were not allowed to obtain liquidity credit from the Central Bank. The LDKP liquidity needs had to be fulfilled from other sources. LDKPs were not permitted to mobilise public funds through saving or deposits. Further, the LDKPs set loan interest rates that were not tied to the Central Bank's benchmark interest rate.

Financial sector reform was carried out by the Indonesian government to create a competitive economy through deregulation of the capital market and a loosening of banking regulations. Several policy packages were issued by the government, starting in 1987. A December 1987 policy package called the *Paket Desember* (PAKDES) 1987

aimed to develop the stock market in Indonesia. This package amended some regulations, including establishing listing requirements in the stock exchange, allowing foreign investors to buy shares in the exchange, and setting a maximum limit on stock prices' fluctuation.

In 1988, a *Paket Oktober*, or October policy package (PAKTO 1988), was issued by the government to deregulate the banking sector (Berenbach, 1997). It gave foreign banks more freedom to operate in Indonesia, imposed less stringent bank requirements, and made it easier for domestic banks to open branches in different regions. The PAKTO 1988 package also facilitated the opening of bank branches by reducing the mandatory reserve requirements from an average of 11% to 2%. This package had an impact on financial institutions operating in rural areas, such as BKD, BKK, LPK, LPN KURK, and LPN. These institutions are included in the category of Rural Fund and Credit Institutions, or *Lembaga Dana dan Kredit Pedesaan (LDKPs)*. In the PAKTO 1988 package, the government stipulated that the LDKPs be given 2 years to transform into BPR banks. In reality, however, many LDKPs had difficulty complying with the BPR transformation requirement. Therefore, in 1989, the government decided to withdraw the requirement by issuing a March policy packet, the *Paket Maret*, or PAKMAR 1989.

In 1992, the government enacted Act No. 7 on Banking. This Act replaced the previous law (Act No. 14 on Banking Principles) and revoked Staatsblad No. 357, which had been issued in 1929 and which governed the BKDs. In addition, this 1992 Act also revoked several other laws governing the establishment of various types of banks in Indonesia, including the Bank Negara Indonesia, the Bank Bumi Daya, the Bank Tabungan Negara, and the Indonesian Export and Import Bank. The Act categorised all banks into two groups: namely, Commercial Banks (*Bank Umum*) and People's Credit Banks (*Bank Perkreditan Rakyat*). Financial institutions included in the LDKP group were given the status of *Bank Perkreditan Rakyat (BPR)* if they fulfilled several requirements. This step was taken by the government because the LDKPs had grown and developed in Indonesian society for a long time, proving that they were needed by the community. Therefore, they had to be recognised in the country's legal system. The BPR status would enable regulators to oversee these institutions uniformly. Many LDKPs were unable to meet the government's requirements, however. In this case, the LDKP business activities were deemed to violate banking laws that require any institution mobilising public deposits to obtain a license as a bank: either a commercial bank or a BPR bank. After the economic crisis hit Indonesia and several other Southeast Asian countries in 1997-1998, the government enacted, in 1998, Law No. 10 on Banking, which

amended the previous Law. However, this amendment did not change the rules regarding the provision of BPR status to the LDKPs.

Subsequently, in 2000, the government established a Microfinance Development Joint Movement (Gema PKM) forum (Baskara, 2014). Participants in this forum encouraged the Central Bank to issue regulations on microfinance institutions. A draft of the Microfinance Institution Act was then prepared by the Central Bank and submitted to the government (i.e., the Ministry of Finance) in 2001 to be discussed and ratified by the *Dewan Perwakilan Rakyat* (DPR), the Indonesian House of Representatives. But it was not until 2003 that the DPR approved the draft microfinance Act. The government at that time did not see any urgency in passing the law (Martowijoyo, 2007). The Central Bank took the additional step of conducting a joint study with a German institution called the Promotion of Small Financial Institutions (Pro-Fi). The study yielded a strategy for developing microfinance in Indonesia, suggesting that the subsidised credit program be removed and that a law legalising financial institutions that do not have licenses as banks or cooperatives be enacted (Martowijoyo, 2007). Unqualified LDKPs that did not meet the requirements for being granted BPR status were the target of this law.

Because there was no Microfinance Institution Act during this period, all financial institutions that mobilised public funds in the form of deposits and savings, such as the LDKP financial institutions, were considered to be in violation of the banking laws. This situation had an impact on the LDKPs' ability to raise funds for lending. After a long debate, the Microfinance Institution Act No. 1 was finally passed by the Parliament in 2013. This Act was effectively enacted in 2015, two years after the initial approval.

2.2.4 Microfinance in Indonesia after the Microfinance Institution Act No. 1 (2013)

The enactment of the Act was a major step toward self-sufficient microfinance institutions in Indonesia. It gave a legal basis for the thousands of LDKPs that had been developing in Indonesia since the colonial era. LDKPs now had to obtain permission from the microfinance supervisory authority (the Financial Service Authority) in order to operate as microfinance institutions. Under this Act, LDKPs are allowed to mobilise public funds in the form of deposits without violating the banking law.

This Act addresses earlier criticisms that the government did not have a clear policy for the development of self-sufficient microfinance, and that it was still oriented toward subsidised credit (Martowijoyo, 2007). It also provided a way out of the microfinance dilemma, whereby LDKPs were forced to acquire a difficult-to-attain BPR status by changing their structure, only to have to compete with subsidised cheap credit from the government.

The Act provided a one-year grace period allowing financial institutions that fell into the LDKP category (such as BKD, BKK, KURK, BUKP, and BMT) to continue to operate without having to obtain a microfinance license from the Financial Service Authority (FSA). LPDs and LPNs were exempted from this regulation and were allowed to continue to operate without having to obtain a license as a bank, microfinance institution, or cooperative. This exception was made because the two institutions had already been operating for decades in conformity with local customary laws.

The Microfinance Institution Act implements a dual-banking system. It accommodates Islamic-based savings and loan activities to meet the demand for Sharia financial products. All activities must comply with Sharia law and the MFI must have a Sharia supervisory board to oversee operational activities in accordance with the law. At the same time, the Act also accommodates traditional banking activities, meeting the demand for general savings and loans products.

The remainder of this chapter covers Indonesian policies and operating regulations for microfinance institutions (MFIs) under Act No. 1—and beyond. The aim is to describe the policies recently adopted by the government for the development of MFIs, some one-hundred years after the first microfinancing initiatives in Indonesia. The discussion will focus on regulations on microfinance institutions issued by the government, including:

1. The Microfinance Institution Act No. 1 (2013).
2. Government Regulation No. 89 (2014) on loan interest rates or yields (in the context of financing and business area coverage by microfinance institutions).
3. Financial Service Authority Circular No. 29/SEOJK.05/2015 on financial reporting by microfinance institutions.
4. Five POJKs (abbreviation for *Peraturan Otoritas Jasa Keuangan*, Financial Service Authority regulations), including:
 - a. POJK No. 61/POJK.05/2015, an amendment of POJK No. 12/POJK.05/2014 on business licensing and institutional requirements for microfinance institutions.
 - b. POJK No. 62/POJK.05/2015, an amendment of POJK No. 13/POJK.05/2014 on the business operation of microfinance institutions.
 - c. POJK No. 14/POJK.05/2014 on the development and supervision of microfinance institutions.

2.3 Indonesian microfinance policies

In the Indonesian context according to The Microfinance Institution Act No. 1 (2013) and the operating regulations, an MFI is an institution that provides financial services to the public either in the form of micro-scale loans or in the form of financing, savings, or business development consulting services. The development of MFIs has been organised around several aims: 1) increasing access to micro-scale credit; 2) improving the economy and productivity of the community; and 3) increasing the income and welfare of low-income and poor people. The financial services at issue can be carried out in accordance either with Islamic Sharia law or with traditional financial norms and practices. If Sharia law is adopted, MFIs must establish a Sharia supervisory board within the organisational structure. This board is responsible for providing advice to management to make sure that an MFI's activities comply with Sharia law.

Foreign ownership of MFIs, whether individually or organisationally, is forbidden by the Microfinance Institution Act. MFIs can only be owned by Indonesian citizens, Indonesian cooperatives, local governments, or village-owned companies. There are two options when it comes to the legal forms MFIs can assume: they can be cooperatives, or else limited liability companies (LLCs). MFI incorporated as LLCs must be owned by a local government or village-owned companies, whose ownership stake must be at least 60%. The remaining shares can be owned by cooperatives or individuals.

MFIs' business activities are limited to financial services for the community, in the form of micro-scale loans or financing, savings, and business development consulting services. Prohibited activities for MFIs include:

- receiving deposits in the form of checking accounts and participating in payment-systems (a set of instruments, banking procedures and, typically, interbank funds transfer systems that ensure the circulation of money);
- conducting business activities in foreign currencies;
- conducting insurance activities as an insurer;
- acting as a credit guarantor;
- providing loans or financing to other MFIs, except to help other MFIs in the same regency/city area overcome liquidity difficulties.

MFIs can only provide loans to clients within one coverage area, such as one village, one district, or one regency. However, savings mobilisation can be implemented outside the permitted area. Selection of the coverage area must be in accordance with the size requirements for paid-in capital for MFIs, as shown in the Table 2.1.

Table 2.1 Coverage area and capital requirement

No.	Business Coverage Area	Capital Requirement
1.	Village	Rp50,000,000.00
2.	District	Rp100,000,000.00
3.	Regency	Rp500,000,000.00

MFIs are permitted to provide loans individually and also to groups. The maximum loan amount is 5% of the total capital for an individual borrower, and 10% of the total capital for a group of borrowers. MFIs can determine the maximum interest rate on loans to be charged to borrowers. However, although the determination of the maximum rate is controlled by the MFI, it must be reported to the FSA every four months. During this four-month period, the MFI is not allowed to charge interest on the loan above the maximum limit that has been set. In addition to reporting to the FSA, MFIs must also announce the maximum interest rate in the newspaper or on a notice board at their main office.

Furthermore, MFIs must transform into BPRs when they have met one of the following two conditions. The first condition is that the MFI provides loans to clients beyond the area of one regency. The second condition is: (a) that the amount of the MFI's capital is 5 times the minimum capital required for BPRs, and (b) the deposits collected by the MFI in one year are 25 times the minimum capital requirement for BPRs.

Basically, MFI regulation and supervision are carried out by the FSA. In practice, however, the supervision function is delegated either to the local government or to other appointed organisations, who carry out monitoring and inspection of the MFIs. In the context of this supervision, MFIs are required to submit financial reports to the FSA every four months.

The financial soundness of an MFI is assessed on the basis of two indicators: solvency ratio and liquidity ratio. Solvency is an indicator of the MFI's ability to repay all long-term as well as short-term liabilities. This solvency ratio is calculated by dividing total assets by total liabilities. MFIs are obliged to maintain a minimum solvency level of 110%. Meanwhile, liquidity refers to an MFI's ability to repay short-term liabilities. The liquidity ratio is calculated by a cash ratio, which is a ratio between total cash (and cash equivalents), on the one hand, and current liabilities, on the other hand. MFIs are required to maintain a liquidity ratio of at least 3%.

If an MFI is experiencing financial difficulties where its liquidity ratio is less than 3% and/or its solvency ratio is less than 100%, the FSA will direct the MFI to take one or more of the following steps:

1. Addition of further capital by the owner.
2. Restructuring of the board of directors and/or commissioners.
3. Overwriting of defaulted loans.
4. Merging or consolidating with other MFIs.
5. Acquisition by another MFI.
6. Control of the MFI's operations by another MFI.
7. Liquidation of assets or liabilities.

2.4 Summary

MFIs have existed in Indonesia since the country was still under Dutch rule. Initially, MFIs were developed to help people heavily indebted to loan sharks as well as small farmers in the villages. Thousands of financial institutions were created for this purpose by the colonial government; the institutions took different forms, including Village Credit Institutions/Village Credit Agencies, or BKDs, "people's banks," and "rice barns" banks. The colonial government set up a financial system that ensured the sustainability of rural financial institutions in various regions in Java and Madura. One important policy implemented during this era involved the formation of the *Algemene Volkscredietbank* (AVB), which served as a source of funding for these institutions and also as a place where they could deposit surplus funds.

After Indonesian independence, there was no significant development of microfinance in the country. The government nationalised various foreign companies and merged *Bank Rakyat Indonesia* (BRI) and AVB into a single, state-owned company. However, during President Soekarno's administration, the Indonesian economy experienced a crisis where prices skyrocketed due to inappropriate monetary policy.

Soeharto, a military general, served as the second president after President Soekarno. Under his government, a subsidised credit program for farmers was created by the government in 1968 through the BIMAS program. Although it failed and was ultimately terminated in 1985, this program sowed the seeds for the subsequent emergence of BRI village units in various regions in Indonesia. The units continued in the form of a commercial rural lending business and successfully served 2.5 million borrowers by the end of 1996.

Soeharto's government formulated various economic policies related to microfinance. For example, the 1988 PAKTO policy package required microfinance institutions in rural areas to transform themselves into a BPR bank by fulfilling several requirements. This

policy was not successful, however, because many of these institutions were unable to meet the requirements in order to become banks. Until the end of 2012, most financial institutions (such as LDKPs) still did not have permission to conduct banking activities, such as the mobilisation of savings from the public.

In 2013, the Microfinance Institution Act No. 1 was passed by the House of Representatives. This Act initiated the development of commercial microfinance institutions overseen by the Indonesian government. Microfinance institutions were expected to become self-sufficient by obtaining public funding in a manner that was previously considered a violation of banking regulations. LDKPs that previously could not acquire the status of licensed banks (BPRs) could now operate using licenses issued to microfinance institutions. At the same time, oversight by the FSA and local governments was expected to help MFIs to grow commercially, and to serve low-income rural communities.

The FSA together with the government issued various operational and supervisory regulations for MFIs. MFIs' lending area is limited to three levels of coverage, conditional on the amount of capital owned. MFI incorporated as LLCs must be owned by a local government or village-owned companies, whose ownership stake must be at least 60%. Foreign business entities or individuals are not allowed to own MFIs. MFIs' size is limited based on the area of business, the amount of capital, and the amount of deposits owned. If the size exceeds the specified limit, an MFI must be transformed into a BPR bank. Finally, the supervision of MFIs is carried out by local governments.

CHAPTER 3 REVIEW OF LITERATURE

3.1 Introduction

The trade-off between outreach and sustainability of microfinance has been debated since many international donors reduced financial supports to microfinance to encourage self-sufficiency and sustainability. While considerable studies have investigated this issue, there is a lack of studies that focus on exploring the possibility of group lending to solve the problem of sustainability-outreach trade-offs, particularly in developing countries like Indonesia.

The current study compares the outreach-sustainability relationship between individual and group lending with a focus on Indonesian microfinance institutions (MFIs). This chapter provides a review of the literature to understand the current body of knowledge about this topic. The search for literature was mainly sourced from online databases in addition to physical resources available in the library such as books and information unavailable online. The main online database was www.scopus.com since it provides more search features. Other databases on business, economics and finance such as www.emerald.com, www.sciencedirect.com and www.tandfonline.com were also explored.

This review of the literature is presented as follows: Section 3.2 explains theory on information asymmetry in the credit market to provide the theoretical context of the microfinance market. Section 3.3 will discuss theories on lending methodology, including individual and group lending. Section 3.4 discuss the concepts of sustainability and outreach; and lending method effects on the relationship between the concepts. Section 3.5 reviews the literature on the relationship between gender and loan terms, including loan amount and interest rates. Section 3.6 reviews the literature on the link between interest rates and repayment rates. Section 3.7 depicts a conceptual framework of the current research based on the review of literature.

3.2 Information asymmetry in the credit market

Information is a valuable economic resource characterised by public good properties which is non-rival and non-exclusive (Nicholson, 2002). The acquisition of information may involve costs. The marginal costs of information acquisition may also differ between individuals. These factors can cause asymmetry information between market actors that can lead to market inefficiency. This section is more related to two problems in the market

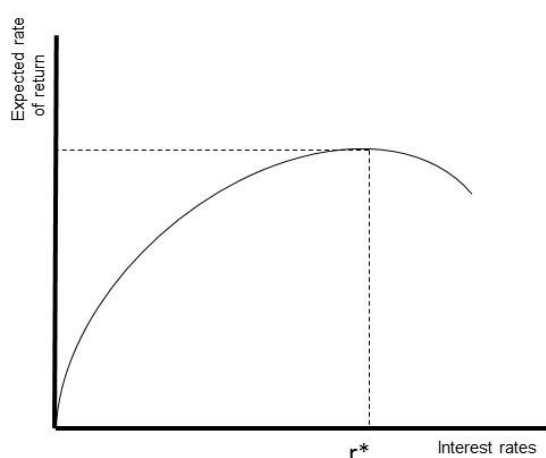
with imperfect information. Adverse selection is where "...different individuals may have different probabilities of experiencing unfavourable outcomes" and moral hazard is when "Individuals can take a variety of actions that may influence the probability that a risky event will occur" (Nicholson, 2002, p. 233).

Basic economic theory suggests that price clears the market at equilibrium when demand meets supply. An increase in demand at any given level of supply will increase the price. However, it might not always prevail in a market with imperfect information such as credit. An increase in the demand for loans is not always followed by an increase of interest rates at a particular level of loan supply. Lenders prefer rationing the borrower to increasing the interest rates. This phenomena was highlighted in a seminal paper of Stiglitz and Weiss (1981). These authors demonstrate a theory that explains why credit rationing exists in an imperfect information market where lenders do not have sufficient information to distinguish risky and non-risky borrowers.

According to Stiglitz and Weiss (1981), lenders can design loan contract terms that put all restriction and controls on all borrower actions to ensure the loan repayment if the lenders have all information about borrowers. The lenders have at least two loan terms (interest rates and collateral) that can be used to influence the behaviour of borrowers. However, unlike the perfect information market, there is asymmetry of information between lenders and borrowers. It is difficult for lenders to determine risk profile or to control the action of borrowers. The information asymmetry is more severe in a rural credit market because it lacks collateral and credit history (Van Tassel, 1999).

Interest rate can have two effects, according to a theoretical model of Stiglitz and Weiss (1981). First, it has a selection effect. The model demonstrates that people who demand loans and are willing to pay higher interest rates, are likely to be riskier borrowers (adverse selection). The loans will be used for investing in riskier projects. Thus, lenders can screen borrowers based on the interest rates they are willing to pay. Second, it has an incentive effect. People who demand loans and are willing to pay higher interest rates, are induced to invest in riskier projects but with higher expected return (moral hazard). These effects of interest rates influence lenders' expected rate of return (Figure 3.1). The figure shows the relationship between interest rates and lender expected rates of return. Risk level of borrowers' projects will affect the likelihood of loan repayment, hence the expected rate of lender's return. The increase of interest rates up to an optimal rate of r^* will give higher expected rate of return to the lender. Any interest rates beyond r^* will make the lender's expected rate of return decrease because of adverse selection and moral hazard effects. Credit rationing will be an optimal decision of a lender when a borrower demands a loan and is willing to pay an interest rate higher than r^* .

Figure 3.1 Interest rates and lender's expected rate of return



Source: Stiglitz and Weiss (1981)

The second loan term that a lender can use is collateral (Stiglitz & Weiss, 1981). Like interest rates, collateral has selection and incentive effects. Collateral values above an optimal level can have adverse selection and moral hazard effects that increase portfolio risk and reduce lender expected profit. The best response of the lender will be credit rationing even though the borrower is willing to offer higher values of collateral.

An example of an imperfect information market is a credit market in a rural area. Neither competitive market nor monopoly power theory can explain some characteristics of the market as outlined by Hoff and Stiglitz (1990):

1. Coexistence of formal and informal lenders.
2. Unavailability of credits during a poor harvest period.
3. Differences in interest rates across different areas which was not reflected in differences in borrower credit risks.
4. Limited numbers of formal commercial lenders.
5. Linkage between loan transactions and good transactions.
6. Commercial formal lenders concentrated in certain areas. Farmers holding land titles were commonly located in those areas.

Imperfect information theory may explain the behaviour in rural credit markets (Hoff & Stiglitz, 1990). Three information related problems in the markets are costly borrower screening, costly monitoring, and limited enforcement. Furthermore, according to Hoff and Stiglitz (1990), lenders can use two types of mechanisms to overcome these problems. A direct mechanism is where lenders spend resources to select, monitor and enforce credits. An indirect mechanism exploits contract design such as loan terms as a

screening and incentive device. The latter mechanism might be relevant to our discussion in the next section about group lending that imposes joint liability into the loan contract design to enhance loan repayment rate. Joint liability is lending via a group of several people which is different with conventional bilateral lending.

3.3 Lending methodology

Basically, there are two type of microfinance lending: individual and group lending. In reality, group lending can take various forms in terms of the number of members or the organisation structure. This section mainly discusses group lending since conventional individual lending is more common. Nevertheless, this section will cover a comparison between individual and group lending in terms of sustainability and outreach.

3.3.1 Types of lending methodology

Literature shows that the phrases of “lending methodology” and “lending method” are used interchangeably. Lending methodology can be defined as the method of loan delivery (Bassem, 2009). Most studies have used lending methodology to describe two types of microfinance lending (see Table 3.1). Basically microfinance lending methodology can be group into group and individual lending (Brandt, Epifanova, & Klepikova, 1998). Loan delivery via group can be named “joint-liability lending”, “group based”, “self-help group”, “solidarity group” or “village banking”. Village banking has a bigger group size than the other group lending and is managed by a local village community (Dorfleitner, Leidl, Priberny, & von Mosch, 2013; Widiarto, Emrouznejad, & Anastasakis, 2017). Solidarity group lending is a type of group lending that is smaller than village banking, consisting of 5-10 people (Ledgerwood, 1998, p. 69). The self-help group is another form of group lending. The group is larger than a solidarity group but smaller than village banking. It consists of around 20 members who join together for various purposes including financial services (Woller, 2002). In general, it can be implied that group lending is a generic term to cover all different types of lending to a group of people. Although group lending without joint liability may exist, it is rarely found in the literature except for an experiment such as conducted by Giné and Karlan (2014).

Table 3.1 Types of lending methodology

	Lending methodology	Lending methods	Type
(Paxton & Thraen, 2003)	v		Group lending Solidarity group lending
(Isaia, 2005)	v		Group lending
(Giné, Harigaya, Karlan, & Nguyen, 2006)	v		Group liability Individual liability
(Hartarska & Holtmann, 2006)	v		Group lending/loan Joint liability loan Individual lending
(Shekh, 2006)	v		Group-based lending
(Bassem, 2009)	v		Group loans Village bank loans Individual loans
(Mersland & Strøm, 2010)	v		Group lending Individual lending
(Brunori & Pines, 2013)	v		Group lending Solidarity-lending group
(D'Espallier, Guerin, & Mersland, 2013)	v		Group lending
(Dorfleitner et al., 2013)	v		Group lending Solidarity lending Village banking Individual lending
(Aye & Nakamori, 2013)		v	Group-based lending
(Di Benedetto & Bengo, 2014)	v		Group lending/loan Individual lending
(Jiang, Mi, & Liu, 2014)	v		Group lending Individual lending
(Raccanello, 2014)	v		Group lending
(Cull, Demirgüç-Kunt, & Morduch, 2014)		v	Group lending Bilateral lending contracts
(Duggan, 2016)	v		Joint liability lending
(Arrassen, 2017)	v		Group lending Individual lending
(Widiarto et al., 2017)		v	Group loan Individual loan Village bank
(Lassoued, 2017)	v		Group lending Individual lending
(Simkhada, 2018)	v		Group lending
(Zamore, Beisland, & Mersland, 2019)	v	v	Group lending Individual lending
(Nkwocha, Hussain, El-Gohary, Edwards, & Ovia, 2019)	v		Group lending Individual lending

Group lending is frequently associated with the Grameen Bank, which has been successfully delivering credit to predominantly poor women secured by social or group collateral (Khandker, Khalily, & Khan, 1995). The Grameen's group consisted of five borrowers with homogeneous gender. Loan repayment was the liability of the entire group. Repayment failure of a member would have the consequence of suspension of

future loans to the group. The loan was less than US\$100 per individual and had to be repaid on a weekly basis over 50 payments. The key factors of the Grameen Bank that minimise transaction costs and default risks are a group mechanism with mandatory saving, the possibility of loan rescheduling in case of force majeure, and the provision of seasonal loans (Khandker et al., 1995).

3.3.2 Group lending

Group lending has been central to solving information asymmetry in the rural credit market. It uses joint liability in the loan contract design. Joint liability requires the entire group to be liable for any unpaid loan from a member (Van Tassel, 1999). This contract design can reduce the information asymmetry problems of adverse selection and moral hazard. It leads to improvement in loan repayment and to lower expected credit risk.

How does joint liability group lending reduce credit risk and improve repayment? The information asymmetry theory has been a foundation of theories of group lending (Hartarska & Holtmann, 2006). This section will discuss some theories that explain how joint liability lending can improve efficiency of the rural credit market. The search of literature on group lending theories was performed with online databases. The specific keywords use in the search can be seen in Appendix 3.1.

3.3.2.1 Peer-monitoring

In the absence of collateral, a loan contract with a group and joint liability can reduce monitoring costs of the lender, induce peer monitoring among group members, and improve repayment. J. E. Stiglitz (1990) was the first to develop a theoretical model of peer monitoring in joint liability group lending that can improve repayment rates. His paper claimed that peer monitoring largely contributed to the striking performance of the Grameen Bank loan repayment rate. He argues that the risk transferred from lenders to the borrower is lower than the benefit the borrowers receive. The author underlined that effective peer monitoring requires contractual design including smaller group size to discourage free-riding, incentive provision, and group homogeneity by assortative grouping.

A paper of Islam (1996) also shows how peer monitoring can enhance loan performance. The loan contract is designed to induce group members to monitor the action of other members because they will be responsible in case of any unpaid amount. Risk of default in individual lending is higher than the risk in group lending with peer monitoring at a given interest rate. Since the expected risk of default is lower, the loan interest rates can also be expected to be lower. This is explained by the default risk-premium model and

credit rationing model. First, the lender incorporates the risk of default into the loan interest rate on top of a risk-free interest rate in a risk premium model. Therefore, a loan with a peer monitoring mechanism can have lower interest rates because of lower risk of default. Second, credit rationing theory shows an inverted-U shaped curve of relationship between loan interest rates and expected return. The optimal interest rates will be the point where the marginal benefit of expected return is zero. Any increase of interest rates beyond the optimum level will attract riskier borrowers, thus increasing the risk of default and lowering the expected return. A peer monitoring loan shifts the curve up, resulting in a higher expected return and bigger loan supply.

According to Armendáriz de Aghion (1999), a joint liability loan contract can encourage peer monitoring and reduce likelihood of strategic default. The effort to monitor can be optimised if the correlation of risks among the borrower's projects are positive. Strategic default can be minimised because of proximity of group members geographically as well as social sanctions imposed by the group. This paper supports the argument of Stiglitz (1990) regarding the group size but it suggests the size is not too small to avoid: 1) joint liability effects, in which a member bears a higher burden of other defaulted loans; 2) cost sharing effects which require higher monitoring costs; and 3) a commitment effect, which is fear of strategic default of other members.

The empirical evidence on the association between group lending and loan performance shows a positive impact of peer monitoring on reducing moral hazard, hence improving loan repayment. Some were experimental studies: either a lab or field experiment. A field experiment with female borrowers in Paraguay has shown a strong association between monitoring propensity and improvement in loan repayment (Carpenter & Williams, 2014). There was 36% lesser probability of repayment problems in women group borrowers with stronger peer monitoring. Cason et al. (2012) conducted a laboratory experiment to compare peer monitoring in group loans to lender monitoring in individual loans. The experiment found a higher repayment rate of group lending if the monitoring cost is lower than individual lending. The difference would not be significant when the monitoring costs are the same. Another field experiment performed by Cassar and Wydick (2010) in five different countries, including the Philippines, Kenya, India, Guatemala and Armenia, also found beneficial outcomes on loan repayments from peer monitoring. However, there is an unfavourable effect of peer monitoring as found by an experiment in India showing that the monitoring reduces risk taking behaviour and the borrower's project profitability (Fischer, 2013), and by an experiment in Burkina Faso indicating that peer monitoring may not reduce moral hazard if the lender is involved in the monitoring, as it crowd out the peer monitoring (Gelade & Guirkinger, 2018).

Additionally, non-experimental studies also found a significant association between peer monitoring and repayment. Positive effects of peer monitoring on loan repayment can be found in a survey of women group borrowers in Jordan (Al-Azzam, Carter Hill, & Sarangi, 2012), a questionnaire survey in Eritrea (Hermes, Lensink, & Mehrteab, 2005), a survey in Georgia (Kritikos & Vigenina, 2005), a focus group interview in Nigeria (Nkwocha et al., 2019), a survey in Togo (Noglo & Androuais, 2015), a survey in Africa (Ohaka, Chidiebelu, Arene, & Mkpado, 2017), two studies in Malawi (Simtowe, Zeller, & Phiri, 2006; Simtowe, Zeller, Phiri, & Mburu, 2007), a survey and secondary data in Southern Zambia (van Bastelaer & Leathers, 2006), and two studies in Guatemala (Wydick, 1999, 2001). Meanwhile, one empirical study in Senegal found no significant link between peer monitoring and repayment because members were uncritical to the delinquent member (Howson, 2013).

Group size or the number group members is important to peer monitoring (Islam, 1996; Stiglitz, 1990). Larger groups reduce the benefit of peer monitoring as it increases the possibility of free-rider problems taking higher risk investments and relying on other members to cover the defaulted loan. It also becomes a disincentive for group members to monitor the peer as the risk of individual members will be lower. Higher monitoring costs from prolonged group decision making, geographical dispersion of members, and diversity in member background may be the other limitation of larger groups. A study of micro credits in south eastern India found evidence of free-riders in a group lending experiment under perfect information where all members could freely interact and communicate (Fischer, 2013). A theoretical model of Mukherjee and Bhattacharya (2015) suggests that an increase of group size will raise not only cooperative efforts in monitoring but also the incentive to deviate from the cooperation. However, the deviation incentive can be reduced with social sanction and joint liability.

Peer monitoring may also be affected by the group leader. A theoretical model of Carli and Uras (2017) argues that effective peer monitoring requires “asymmetric loan terms” that give a bigger role to one of the members to monitor the peer. The role of group leader is also affected by the level of social ties of the leader with the members (Hermes et al., 2005). Peer monitoring is strongly associated with joint liability but it is moderated by group leader perception on its authority (Hu, Chan, Zhang, & Yang, 2016). However, although it creates larger responsibility and higher motivation to monitor the group members, a study in Nigeria found that group cohesion decreases with abuse of power by some of the group leaders (Nkwocha et al., 2019).

3.3.2.2 Peer selection

Joint liability lending can persuade peer selection that can reduce adverse selection problems by exploiting local information and help the lender to achieve high loan performance. An earlier paper of Varian (1990) offers a theoretical model that suggests lenders gain an optimal value of investment and reduce costs of borrower screening from joint liability lending.

De Aghion and Gollier (2000) demonstrate a model arguing that joint liability will make the lending interest rates lower even if the group members have limited information about one another and information search by the lender is costly. The “collateral effects” of joint liability decrease the interest rates. In cases of perfect information among the members, “selection effects” reduce interest rates by protecting safe borrowers from pairing up with risky borrowers.

Ghatak (1999) introduces a theory of assortative matching predicting that joint liability lending will induce a member to self-select the group members based on the risk. Riskier borrowers and less risky borrowers will join different groups together, which is called “positive assortative matching”. The high-risk group will end up with higher interest rates than the low risk group. By taking into account the size of loan, Van Tassel (1999) demonstrated a theory predicting the same positive assortative matching outcome. However, according to Guttman (2008), the positive assortative matching may not hold if the lender imposes refinancing threats and it turns to a “negative assortative matching”, where safe and risky members are grouped together. The risky member will offer side payment(s) to the safe members. In case of no side payment, negative assortative matching never occurs. A model without side payment can be seen in a paper by Ghatak (2000) analysing the effects of joint liability on repayment rates or lending without conventional collateral. The model predicts that joint liability will optimise the repayment rates through exploiting local information in peer selection of group formation.

Gangopadhyay and Lensink (2014) offer a model of a group contract with asymmetrical member responsibility. This contract can also lead to a negative-assortative or heterogeneous matching group that results in an optimal outcome. Reito (2019) demonstrates a theoretical model predicting that heterogeneous matching or a mixed group with different risk profiles may give higher efficiency than assortative matching as in Ghatak (1999). Intragroup insurance can explain this difference, with side payments in the form of transfer of goods and services to the lower risk borrower. However, this mixed group can be possible only in the non-existence of homogeneous group equilibria. It might be implied that even if borrowers cannot find a pair with the same risk profile,

joint liability group lending can still be possible to give a positive outcome. High risk borrowers would be screened out in the positive assortative matching model while she would find a group with other high risk borrowers in the negative assortative matching model (Chowdhury, 2007).

Laffont and N'Guessan (2000) offer a theoretical model arguing that a joint liability contract will not be efficient if group members do not have information about each other's project risk. The model also introduces the possibility of "collusive behaviour" that makes joint liability lending inefficient even if the members have full information. Information about the expected correlation of members' investment risks can influence the outcome of a joint liability lending contract. A theory of Katzur and Lensink (2012) argues that although the investments of positively correlated group members' give a worse outcome in a joint liability contract, it can result in a better payoff if the investments are relatively safe.

A literature review by Rathore (2017) presents four empirical papers related to peer selection in Costa Rica (Wenner, 1995), three group lending programs in Bangladesh (Sharma & Zeller, 1997), one in Thailand (Ahlin & Townsend, 2007), and field experiments in South Africa and Armenia (Cassar, Crowley, & Wydick, 2007). These studies found evidence of positive effects of peer selection on loan performance.

An empirical study in Malawi showed that peer selection were not significant in mitigating default problems in the long run (Simtowe et al., 2007). Likewise, an experimental study of Giné and Karlan (2014) did not find statistical evidence of a relationship between peer screening and loan performance of group loans in two different areas of the Philippines. The first experiment was in an area with pre-existing group lending while the second experiment was in a new expansion area. The investigators speculates that the theory may apply only in extreme conditions.

3.3.2.3 Peer pressure or group sanction

Peer pressure or social sanction may improve repayment performance. In joint liability group lending for non-collateralised loans, the lender imposed sanction is a suspension of future loans to the whole group. Besley and Coate (1995) analyse this situation with a theoretical model predicting that successful members will be encouraged to cover the unpaid loan of delinquent members in a joint liability contract. It also reduces returns from voluntary default, thus discouraging such behaviour. However, Becchetti and Pisani (2010) predict that borrowers' discipline declines with competition since a delinquent member can easily access the credit of other lenders.

What empirical evidence tell us about the association between peer pressure and loan repayment? A study in Southern Zambia found that such pressure has association with loan repayment behaviour (van Bastelaer & Leathers, 2006), a study in Malawi showed that variation in loan repayment can be explained by peer pressure, peer monitoring, and dynamic incentive (Simtowe et al., 2006), a study in Georgia found no incidence of peer pressure because loan repayment problems had been resolved by peer support (Kritikos & Vigenina, 2005), and a study in Jordan revealed a reduction of delinquency because of group pressure, social ties, and peer monitoring (Al-Azzam et al., 2012). However, a study on a Rural Finance Company in Malawi did not indicate a significant relationship between peer pressure and moral hazard (Simtowe et al., 2007). This supports the previous study in Guatemala that did not find evidence of such a relationship (Wydick, 1999).

Despite the significant role of peer pressure on repayment, several studies found empirical evidence of the negative impact of peer pressure on group lending. The downside of peer pressure includes excessive punishment among the members as found in a field experiment in Northern India (Czura, 2015), social costs to poor borrowers in Bangladesh and Sri Lanka (Montgomery, 1996), and discouraging innovation micro lending borrowers in Ethiopia (Hirth & Pestonjee, 2016)

3.4 Sustainability and outreach

The review of literature in this section is mainly to establish basic concepts of sustainability and outreach as well as to compare the sustainability-outreach relationship between individual lending and group lending. It also covers literature about sustainability and outreach in relation to the Indonesian context.

3.4.1 Sustainability

Sustainability is an important concept in microfinance and for this research. It has been discussed from various perspectives. The following excerpts define sustainability in the context of microfinance:

...lender's capacity to operate for a considerable period of time, measured in decades, independently of subsidy or altruistic support.
(Von Pischke, 1996)

...full cost recovery or profit making, and is associated with the aim of building microfinance institutions that can last into the future without continued reliance on government subsidies or donor funds.
(Conning, 1999)

at present, a large number of microfinance programmes still depend on donor subsidies to meet the high costs, i.e. they are not financially sustainable. (Hermes & Lensink, 2007)

Sustainability of microfinance institutions is defined as the long-term continuity of the microfinance programme, which involves continuation of financial and nonfinancial services of microfinance institutions. (Thomas & Kumar, 2016)

Sustainability of microfinance has been associated with independency from donor financial supports or subsidy. To achieve the objective, microfinance should be profitable (S. Johnson, 2009). The decline of financial support from donors to microfinance has occurred since the 1990s and it might have led to a commercialisation and profit maximisation orientation of microfinance (Wagona Makoba, 2001). A profitable microfinance is also a prerequisite for accessing larger capital from the capital market (Campbell & Rogers, 2012). Several studies have investigated factors that influence the profitability of microfinance such as governance (Iqbal, Nawaz, & Ehsan, 2019; Kyereboah-Coleman & Osei, 2008), product and services diversification (Biggar, 2009; Zamore, 2018), regulation (Ambarkhane, Singh, & Venkataramani, 2018; Pati, 2017), economies of scale (Ngo, Mullineux, & Ly, 2014), portfolio quality (Arrassen, 2017), and capital structure (Pati, 2017).

Microfinance sustainability is also related to efficiency. Two methodologies used in efficiency studies are: non-parametric, such as Data Envelopment Analysis (Farida, Osman, Lim, & Wahyuni, 2018; Khanam, Parvin, Mohiuddin, Hoque, & Su, 2018; Wijesiri, Yaron, & Meoli, 2017; Zainal et al., 2019); and parametric, such as Stochastic Frontier Analysis (Hermes, Lensink, & Meesters, 2011). The efficiency can be measured by social output and financial output. Financial efficiency is related to cost efficiency (Khanam et al., 2018) while social efficiency is related to outreach, which will be discussed in a separate section.

There might be a relationship between outreach and profitability. Kablan (2014) analysed microfinance data in West Africa and found an inverse relationship between outreach and profitability. A meta-analysis review of Fall, Akim, and Wassongma (2018) found that microfinance in African countries had lower profitability than microfinance in Latin America due to social orientated operation and subsidy of African microfinance. Awaworyi Churchill (2019) analysed data of 1595 microfinance institutions from 109 countries and found evidence of a trade-off between profitability and depth of outreach. Whereas, trade-off between breadth of outreach and profitability is only found in non-

profit-oriented microfinance. Similarly, based on data analysis on 456 microfinance institutions from 70 countries, Louis et al. (2013) found that profit-oriented microfinance reached more clients but with larger loan size, indicating less depth of outreach.

Meanwhile, Kar (2013) could not confirm trade-off between profitability and depth of outreach in data of 409 microfinance institutions from 71 countries even after disaggregation of different types of profitability indicators. This finding is also supported by a study of Nwachukwu (2014) using data from 426 microfinance institutions from 41 developing countries. It was found that microfinance profitability is not negatively correlated with outreach to the poor.

Several studies have investigated the relationship between interest rates and profitability. Evidence has been found of association between profit-oriented microfinance and higher interest rates (Roberts, 2013). The conclusion was based on analysis of 358 microfinance institutions from six world regions. However, the author underlines that profit orientation is not necessarily associated with profitability, which is also supported by Leite, Mendes, and Sacramento (2019) based on analysis of 202 microfinance institutions from 52 countries. In contrast, Kar and Swain (2014) found that higher interest rates correspond to higher probability and higher repayment rates. Furthermore, the marginal profit of individual-based lenders from increasing interest rates was higher than other type of lenders. These results are supported by evidence from Nwachukwu (2014) that found an increase of interest rates by 1% a year would increase likelihood to be profitable by 4.71%. However, annual interest rates above 76% would lower the likelihood by 3.10%. However, Awaworyi Churchill (2018) did not find evidence of an interest rate threshold from microfinance in 33 African countries. Interest rates are positively associated with profitability.

The literature review has indicated that the motivation to achieve sustainable microfinance was partly caused by the decline of financial supports from donors or governments. Microfinance is urged to be self-sufficient by generating enough revenues to cover financial and operational costs; thus it can serve the poor in ongoing basis. Although profitability and efficiency seem to be interrelated concepts, the current research will only refer sustainability to profitability. This research is investigating sustainability of individual lending and group lending at the loan level. Whereas, efficiency is commonly a performance measure at the institution level.

3.4.2 Outreach

Outreach is a main concept in this research. The following excerpts define outreach in the context of a microfinance institution:

...the effort by MFOs [(microfinance organisations)] to extend loans and financial services to an ever-wider audience (breadth of outreach) and especially toward the poorest of the poor (depth of outreach). (Conning, 1999)

...the social benefits of microfinance for poor clients... (Schreiner, 2002)

...the number of clients served by an entity. It can be measured using average loan size and percentage of women borrowers that measures depth of outreach, and average length of client relationships and time between instalment payments as a measure of length and scope of outreach. (Semaw Henock, 2019)

González Vega (1998) and Schreiner (2002) propose six dimensions of microfinance outreach. The performance of microfinance can be assessed with one or more of the following criteria:

1. Quality: the value of product that microfinance offers.
2. Costs: the amount spent to obtain the service including interest costs and transaction costs.
3. Depth: the poverty level of clients that microfinance serves.
4. Breadth: the number of microfinance poor clients.
5. Length: the continuity of financial service that microfinance provides.
6. Variety/scope: the number of products that microfinance provides.

Schreiner (2002) underlined the interrelationship of the dimensions. For example, providing the service of saving can increase the length of the other service. It helps the microfinance to fulfil funding needs for lending. There is also the possibility of trade-off between depth and breadth of outreach (Cull, Demirgüç-Kunt, & Morduch, 2007). Microfinance with a greater number of borrowers might serve fewer numbers of the poorest.

There are other studies that propose a new measure of outreach. For example, Bibi, Balli, Matthews, and Tripe (2018) propose a new measure of outreach by incorporating microfinance market share into the calculation of outreach depth and outreach breadth. Paxton (2003) proposes a poverty outreach index that combines both depth and breadth of outreach. However, these measurements have not widely been used in subsequent studies.

A review of literature reveals three main pieces of information. First, most studies have used depth of outreach as a measurement for microfinance outreach performance (such as Arrassen, 2017; Hossain et al., 2020; Meyer, 2019; Quayes, 2015; Reichert, 2018). The depth of outreach is frequently measured by the poverty level of the borrowers and the number of female borrowers. Women are an important indicator of outreach because credits from microfinance can help empower women. Moser (as cited in Sanyal, 2009) refers to women's empowerment as "... women's capacity to increase self-reliance, their right to determine choices, and their ability to influence the direction of change by gaining control over material and nonmaterial resources." Meanwhile, poverty level was predominantly proxied by the sizes of loan (Morduch, 2000; Schreiner, 2002). Richer borrowers tend to take out bigger loans (Morduch et al., 2003). Wealthier borrowers are not interested to smaller loans (Steel & Charitonenko, 2003). Although more accurate measurement of poverty is desirable, it is limited by the data availability (Quayes, 2015).

Second, depth of outreach may adversely affect microfinance sustainability in terms of profit, efficiency, interest revenue, and operating expenses. Some studies found a trade-off between depth of outreach and profitability (Awaworyi Churchill, 2018, 2019; Louis & Baesens, 2013; Necesito, 2016; Pedrini & Ferri, 2016), between depth of outreach and interest rates (Abrar, 2019), between depth of outreach and operating expenses (Meyer, 2019), and between depth of outreach and efficiency (Abate, Borzaga, & Getnet, 2014; Hartarska, Shen, & Mersland, 2013; Hermes et al., 2011; Quayes & Khalily, 2014; Xu, Copestake, & Peng, 2016; Zainal et al., 2019).

However, other studies indicated that depth of outreach did not adversely affect sustainability. There was evidence of a positive relationship between depth of outreach and financial profitability (Abdullah & Quayes, 2016; Huq et al., 2017; Kar, 2013; Quayes, 2012, 2015, 2019) and between depth of outreach and efficiency (Bos & Millone, 2015; Ngo et al., 2014).

The studies have shown that the implications of depth of outreach for microfinance sustainability are still inconclusive. While some studies found adverse effects of depth of outreach on various indicators of microfinance sustainability, there is also evidence of the opposite result. Many of those studies analysed cross country data (such as Abrar, 2019; Churchill, 2019; Louis and Baesens, 2013; Meyer, 2019, and Xu et al., 2016). It seems that there are country specific factors that may influence the relationship of depth of outreach and sustainability (Abrar, 2019 and Xu et al., 2016).

Third, literature reveals that microfinance outreach might be influenced by several factors as summarised in the following five themes:

1. Lending methodology may affect both breadth of outreach and depth of outreach. Arrassen (2017) found evidence from MFIs in Central African countries that group lending has deeper outreach than individual lending. Similarly, Navajas, Schreiner, Meyer, Gonzalez-vega, and Rodriguez-meza (2000) demonstrated that lending to a group can have deeper outreach than lending to individuals based on microfinance data in Bolivia.
2. The size of microfinance was found to affect the loan size. Bigger MFIs are associated with larger loan size (indicating worse depth of outreach) based on analysis of 409 microfinance institutions from 71 countries (Kar, 2013). However, Ngo et al. (2014) performed cross countries analysis of microfinance and could not find evidence of the relationship. More specifically, the study found that larger microfinance can achieve both outreach and financial performance simultaneously.
3. Profit-oriented and non-profit oriented differences might have different effects on both outreach and sustainability of microfinance. Based on a large data sample of microfinance in world countries, Quayes (2012) found that non-profit microfinance has deeper outreach than profit oriented microfinance. Louis and Baesens (2013) found that for-profit microfinance is associated with shallow depth of outreach. They could not find evidence of a positive relationship between profit-oriented microfinance and financial efficiency.
4. Subsidy is found to be insignificant to achieve simultaneously outreach and financial performance according to Quayes (2015), based on analysis of 764 microfinance institutions from 87 countries. However, Awaworyi Churchill (2018) suggest ongoing subsidies are needed to encourage microfinance outreach for microfinance in African countries because the study found depth of outreach was negatively correlated with sustainability indicators.
5. Microfinance can take various institutional forms such as NGO, non-bank financial institution, cooperative, or bank. Arrassen (2017) found that NGOs had the highest social performance while banks and cooperatives showed the lowest depth of outreach. The study was based on data of microfinance from African countries.
6. The competition level of microfinance may affect the outreach depth and breadth of microfinance. Hossain et al. (2020) analysed competition level microfinance based on the Boone indicator, the Lerner index and the Herfindahl–Hirschman index (HHI) and found that higher competition is associated with lower outreach breadth, but it improves outreach depth.

7. Disclosure level reflecting accountability of microfinance is found to be significant in the relationship of outreach and sustainability (Xu et al., 2016). Poorly disclosed microfinance institutions shows sign of depth of outreach and sustainability trade-off, while such trade-off was not found in highly disclosed microfinance.

Although the review has shown that outreach can have multiple dimensions (depth, breadth, scope, length, cost, and quality), most studies assessed it by the depth of outreach. Data availability and measurement issues may explain this fact. The present research only focuses on the depth of outreach since it evaluates the performance of individual lending and group lending at loan levels. Meanwhile, breadth of outreach is related to performance at the institution level.

The review also tells us that outreach may potentially affect efficiency and sustainability of microfinance. Lending to poorer or women borrowers may have impacted on income, costs, or portfolio quality. The literature also revealed that there are various factors that might influence the relationship between sustainability and outreach of microfinance. The lending methodology factor is the focus of the current research.

3.4.3 Relationship between depth of outreach and sustainability

This section reviews literature about the association between depth of outreach and sustainability. Two indicators of outreach depth are women borrowers and poorer borrowers. Sustainability is indicated by interest rates and repayment rates. A literature review about the relationship between gender and loan terms (interest rates and loan amount) is presented in a separate section as it might involve specific issues of gender discrimination.

3.4.3.1 Gender and repayment rates

Women have been associated with higher loan repayment rates. Grameen Bank is an example of how lending to women can have low default rates. According to Hulme and Mosley (as cited in Abdullah & Quayes, 2016), microfinance can enhance its financial performance with focusing on female borrowers. Using panel data of 892 microfinance institutions, Abdullah and Quayes (2016) found that there is positive association between portfolio yield and proportion of women in microfinance. This is also supported by a finding of Nanayakkara (2017) in 235 microfinance institutions from 63 countries. The paper found evidence of a positive association between the proportion of women in microfinance and microfinance performance. Adanu and Boateng (2015) found likelihood of default for male borrowers is higher than females based on data from microfinance in

Ghana. Alam, Moir, and Ibn Boamah (2019) analysed data from Canadian microfinance with an individual lending methodology and found that female borrowers' default rates are slightly lower than male borrowers.

In contrast, although women may be more risk averse, less movable and more trustworthy, Necesito (2016) found a higher percentage of female borrowers is associated with higher portfolio risk based on analysis of 119 microfinance institutions in the Philippines. The proportion of female borrowers might also be associated with a decline in profitability (Awaworyi Churchill, 2018). Profitable microfinance was associated with fewer women borrowers. Fall et al. (2018) found higher operating costs for microfinance that served women, based on a systematic meta-analysis review.

Furthermore, a meta-analysis review by Reichert (2018) concluded no association between women borrowers and performance. Similarly, Dorfleitner, Just-Marx, and Priberny (2017) also found no significant relationship between gender and repayment rates from data of Nicaraguan microfinance institutions.

3.4.3.2 Income and interest rates

The income level of a borrower is often associated with the amount the borrower's loan (Hatch & Frederick, 1998). Many studies have used loan amounts as a proxy for income (Schreiner, 2002). It is a predominant measure of outreach (Morduch, 2000). Richer borrowers tend to take out bigger loans (Morduch et al., 2003) and are not interested in smaller loans (Steel & Charitonenko, 2003). Although a more accurate measurement of poverty is desirable, it is limited by data availability (Quayes, 2015). Table 3.2 shows empirical studies used loan size as the proxy for the depth of outreach or poverty level of borrowers.

Table 3.2 List of studies using loan size as proxy of income or poverty level

No	Reference	Proxy for poverty level or income
1.	Miyashita (2000)	Average loan size to GDP per capita
2.	Cull et al. (2007)	Average loan size to GNP per capita
3.	Cull, Demirgüç-Kunt, & Morduch (2009)	Average loan size
4.	Gutierrez-Nieto et al. (2009)	Average loan balance per borrower to GNI per capita
5.	Hermes et al. (2011)	Average loan balance per borrower
6.	Quayes (2012)	Average loan balance per borrower divided to GNI per capita
7.	Louis and Baesens (2013)	Average loan size per borrower to GDP per capita
8.	Roberts (2013)	Average loan size
9.	Vanroose and D'Espallier (2013)	Average loan size per borrower to GDP per capita
10.	Abate et al. (2014)	Average loan size
11.	Quayes and Khalily (2014)	Average loan balance per borrower
12.	Brière and Szafarz (2015)	Average loan size
13.	Quayes (2015)	Average loan balance to GNI per capita
14.	Widiarto and Emrouznejad (2015)	Average loan balance per borrower to GNI per capita
15.	Mahinda Wijesiri, Viganò, and Meoli (2015)	Average loan balance
16.	Lebovics, Hermes, and Hudon (2016)	Average loan size
17.	Churchill (2017)	Average loan size
18.	Sheremenko, Escalante, and Florkowski (2017)	Average loan amount per borrower
19.	Widiarto et al. (2017)	Average loan balance
20.	Abrar (2019)	Average loan size

Several studies have investigated the link between borrower incomes proxied by loan size with loan interest rates. Conning (1999) argues that microfinance targeting poorer borrowers needs to charge higher interest rates to be sustainable. The loans require higher costs to cover higher staff costs per loan. Nwachukwu, Aziz, Tony-Okeke, and Asongu (2018) investigated determinants of interest rates using data of 300 microfinance institutions from 107 developing countries. The study found that wealthier borrowers as indicated by larger loans are associated with lower interest rates. The authors argue that larger loans are more cost efficient to microfinance because of a lower administrative and bad debt expenses. Eventually, an efficient microfinance institutions can charge lower interest rates to borrowers (Basharat, Hudon, & Nawaz, 2015). Microfinance requires higher operational costs to administer and collect small loans relative to larger loans (Rosenberg, Gaul, Ford, & Tomilova, 2013). The costs are taking into the calculation of lending interest rates.

Similarly, Abrar (2019) analysed data of 382 microfinance institutions from 70 countries and found evidence of a negative relationship between loan size and interest rates. The

smaller loan size, indicating a less wealthy borrower, is associated with higher interest rates.

Meyer (2019) found a significant negative relationship between loan size and yield on portfolio from an analysis of data from 1,805 microfinance institutions. A 10% decrease in loan size would cause a 0.3% increase in portfolio yield. Higher costs of small scale loans explains the increase of yield.

3.4.3.3 Income and repayment rates

Kodongo and Kendi (2013) analysed data of Kenyan microfinance institutions and indicated that 1 unit increase of log loan amount is associated with a decrease of default probability by 0.23. The authors argued that larger loans are associated with group lending and more experienced borrowers. These borrowers might have lower credit risks. Likewise, Worokinasih and Potipiroon (2019) found loan terms including a higher loan amount, lower interest rates and appropriate repayment schedule are positively related to business performance and hence the loan repayment. The study was conducted in Indonesian microfinance institutions.

Furthermore, based on microfinance data in three regions of Tanzania, Danstun and Harun (2020) found a negative relationship between loan sizes and portfolio at risk (PAR). One unit increase of loan size reduces PAR by 1.487. It was interpreted that the larger loan reflects a better borrower's credibility and business experience.

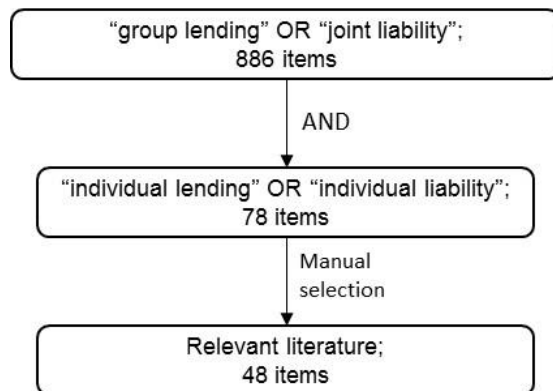
3.4.4 Lending methodology comparison in outreach and sustainability performance

Two types of lending methodology are individual lending and group lending. Each lending method has different measures to minimise the problems of adverse selection, moral hazard, and enforcement. Individual lending uses interest rates to screen borrowers and uses collateral to mitigate moral hazard and enforcement problems. Meanwhile, group lending with joint liability uses peer selection, peer monitoring and peer pressure. This section will compare outreach and sustainability between individual lending and group lending based on a review of literature.

The literature search strategy for this purpose can be seen in the Figure 3.2. The main database was www.scopus.com. The first step was to select all literature that has keywords of "group lending" (including synonyms) or "joint liability" (including synonyms). The keywords were searched in database fields of either title, abstract or keyword. This step resulted in 886 items. The second step was to select from the previous results that had keywords of "individual lending" and "individual liability" including synonyms. This

generated 78 items. The last step was to manually evaluate and select from the 78 items. This last step gave 48 items of relevant literature that makes comparisons between individual lending and group lending. Specific keywords used in this search can be seen in Appendix 3.2.

Figure 3.2 Literature search group and individual lending



3.4.4.1 Lending methodology and repayment performance

Joint liability group lending is expected to reduce adverse selection and the moral hazard problem of lending in an imperfect information market. It imposes peer selection, group monitoring and group sanctions to improve repayment. There are several studies comparing the loan repayments between group lending and individual lending.

Data from a micro credits program in Zimbabwe revealed that group lending with joint liability has higher repayment rates than individual lending (Bratton, 1986). This outcome can be enhanced by stricter group sanctions than peer selection mechanisms. However, Calidoni and Fedele (2009) suggest that people in urban areas are characterised by lesser local information and social punishment, which makes joint liability lending less effective to improve loan repayment. Their theoretical model demonstrates that the best possible approach to lending to people without collateral in urban areas where there is lack of local information and social sanction is through provision of loans through a combination of cooperatives and the cooperative association, as implemented in three Northern Italian microfinance institutions. Profit maximisation motives in single projects carried out by several borrowers can have higher loan repayment than multiple projects borrowing.

A theoretical model of Jeon and Menicucci (2011) focused on the “state non-contingent” repayment liability of the Grameen Bank. With that liability, borrowers must repay loans regardless of any shocks. The “state contingent liability” will give insurance to the borrower in case of shocks. However, insurance on individual shocks might create

agency costs. Their model demonstrates that individual lending has poorer repayment rates than group lending after taking into account contingent insurance or verification costs.

In contrast, Ladman and Afcha (1990) found no improvement in repayment of joint liability lending based on data from micro credits in Bolivia. Nevertheless, group lending increased the likelihood of loan approval and offered more technical assistance than individual lending.

An experiment by Abbink, Irlenbusch, and Renner (2006) with university students in Germany found that group lending repayment rates are higher than individual lending. Differences in group size and social connectedness among the borrowers did not significantly affect the performance of group lending. This finding is not supported by evidence of a natural experiment of microfinance in Pakistan (Mahmud, 2019). The individual lending was converted into joint liability group lending. The study found pre-existing social ties of the members has contributed to improvement in group lending performance.

Cason et al. (2012) carried out an experiment in two universities in Australia and one university in India. The study found that when group monitoring costs are lower than lender monitoring costs, group repayment rates are better than individual lending repayment rates. The repayment rates are the same when there are no differences in monitoring costs. Furthermore, the study found no differences in repayment performance between simultaneous group lending and sequential group lending as adopted by the Grameen Bank.

Using data of 420 clients from 38 microfinance institutions in Kenya, Kodongo and Kendi (2013) compared the performance of individual and group lending. The proportion of default loans in group lending was smaller than for individual lending. The study found evidence that group lending could perform better than individual lending in terms of repayment. It also found that likelihood of default is positively associated with interest rates and negatively related to loan size.

A theoretical model of Sinn (2013) evaluates the performance of three types of microfinance lending, including sequential group loans, simultaneous group loans, and individual loans. It was argued that sequential loans will have the highest repayment rates if contract enforcement in simultaneous and individual loans is weak. When the contract enforcement is strong, simultaneous loans will have the highest repayment rates. This finding is slightly different with the previous evidence of Cason et al. (2012)

that found no differences in repayment performance between simultaneous group lending and sequential group lending.

Arnold, Reeder, and Steger (2013) argue that although group lending has higher repayment rates and lower interest rates, it may create larger deadweight loss than individual lending. Group lending imposes social penalties on borrowers in the case of loan default while the lender imposes penalties on individual borrowers on default in individual lending. Therefore, default loans in group lending may potentially produce larger consumer losses than individual lending. However, the losses can be minimized if members of the group lending are cooperative or disciplined. The deadweight loss is also positively related to loan interest rates. Thus, individual lending can be more dominant in market equilibrium than group lending.

Vigenina and Kritikos (2004) investigated difference in repayment rates between individual and group lending in evidence from Georgian microfinance. Each lending method applied a different incentive mechanism. Access to future and bigger loans was given to successful individual borrowers. Access to future loans was given to successful groups. Collateral was only required in individual loans. The study found no significant difference between those lending methodologies.

Giné and Karlan (2014) conducted two experiments in the Philippines to compare repayment performance of individual and group lending without changing the weekly repayment schedule. First, an existing joint liability group lending was changed into individual lending. Second, new individual and group lending was developed in different areas. The shift from group lending to individual lending had no impact on repayment performance but it altered the social networking of the members, leading to lesser quantity but higher quality interaction. The shift to individual lending also made members socially more connected because there was no more obligation to put pressure on other members in case of loan default. The importance of social capital can also be seen from a theoretical model of de Quidt, Fetzer, and Ghatak (2016), which demonstrates that repayment will not improve if joint liability is removed from a group lending. This supports the finding of Giné and Karlan (2014) that repayment rates can increase even if group lending is adopting individual liability on condition that the social capital in the group is also increased. Coleman (as cited in Worokinasih & Potipiroon, 2019, p. 31) defined social capital as "...a valuable asset that results from access to resources made available through social relationships".

Attanasio et al. (2014) conducted a field experiment to compare repayment rate and poverty between group and individual borrowers in rural Mongolia. The participants were

randomised. The study found that participants in group lending have higher consumption and entrepreneurship than individual borrowers. There was no evidence of differences in income and repayment rates.

Jarungrattanapong (2018) conducted a field experiment in Thailand with 256 villagers. The study found joint liability lending equipped with dynamic incentive was not associated with higher repayment. The repayment was associated with group lending with joint liability but without dynamic incentive. This finding might add to the previous evidence of Vigenina and Kritikos (2004) that found no significant difference of repayment rates between individual and group lending in evidence from Georgian microfinance that applied different types of incentives for individual and group loans.

The investigation of repayment performance of group lending and individual lending used various strategies, including empirical and theoretical. The empirical studies were conducted either by survey, lab-experiment, or field experiment. It seems that group lending can perform better than individual lending if it fulfils conditions such as an incentive mechanism, social capital, credible sanctions and enforcement, monitoring costs, and social ties.

3.4.4.2 Lending methodology and interest rates

Although the evidence is still inconclusive, group lending might reduce the default risk in the context of the rural credit market where collateral and credit history are scarce. Previous studies have provided some evidence of the performance of group lending in comparison to individual lending. Theoretically, lenders translate the risks into the interest rate component as a risk premium; thus it is expected that lower risk borrowers will be charged with lower interest rates. In addition, microfinance uses revenues from loan interests to cover operational costs. Costly lending methods requires higher interest revenues and vice versa. There are some studies that have investigated the differences in lending costs between individual and group lending that found the lending type affected the interest rates lenders charged to borrowers.

Assortative matching of group members persuades the members to find a partner who has a project with the same likelihood of success (Zhao & Gao, 2011). This will decrease the monitoring costs, as also evident by Bratton (1986) in Zimbabwe. The group mechanism also provides lower interest rates and increases likelihood of credit approval. Data from a micro credits program in Zimbabwe revealed that the group liability lending had smaller administrative costs (Bratton, 1986), although the same did not occur in micro credits in Bolivia (Ladman & Afcha, 1990). In addition, lending to an individual has

higher screening costs for the lenders than peer selection in group lending (Navajas, Conning, & Gonzalez-Vega, 2003).

A theoretical model of Arnold et al. (2013) demonstrates that although group lending creates larger deadweight loss than individual lending, it has lower interest rates. Using data of 420 clients from 38 microfinance institutions in Kenya, Kodongo and Kendi (2013) compared individual and group lending. It was found that interest rates of group loans were lower than individual loans. In contrast, Tchakoute-Tchuigoua (2012) found group lending of village banks is associated with higher interest rates, based on analysis of 810 microfinance institutions in several world regions. The agency and lending costs of the banks are higher than for non-village banks.

3.4.4.3 Lending methodology and loan sizes

Group lending with joint liability is a lending innovation to help the poor to access small loans without collateral that otherwise could not be provided by conventional individual lending. Madajewicz (2011) argues that the coexistence of group and individual lending in the microfinance market can be explained by the differences in borrower wealth. Individual lending serves wealthier borrowers with relatively larger loans while group lending focuses more on poorer borrowers with smaller loans.

However, Yang, Jialali, and Wei (2011) found that borrowers demand larger loans in group lending than individual lending. This is based on data from a survey of microfinance borrowers in Xinjiang Uygur, China. The author argues that lenders provide larger loans to group borrowers because it is considered safer than individual lending. This is supported by the arguments of Kodongo and Kendi (2013) that group loans are often associated with larger loan size as the loans have lower default risks.

There is a lack of empirical or theoretical studies about the relationship between lending method and the amount of loan borrowers demand. The findings are inconclusive and required further investigation. Nevertheless, the present research argues that average loan sizes in group lending is lower than individual lending since group lending has been developed to meet the credit demand of poorer borrowers.

3.4.4.4 Lending methodology and gender

The literature shows that it seems there is a link between women borrowers and a preference for group lending. Government policies might have encouraged the use of group lending as a strategy for women's empowerment, such as the self-help-group programs that the Indian government has adopted to improve women's economic welfare (Pathak & Singla, 2017). Group lending was found to be adaptable to the social and

cultural environment of women in Northern India. It increased the accessibility of women to micro credits (Singh, 2015). Isaia (2005) illustrated a Jordanian microfinance institutions that provides lending to women with group lending. The lending suits the socioeconomic characteristics of the women borrowers. Women can gain higher social capital by participating in group lending, as is evident of women borrowing in India (Sanyal, 2009). Group meetings and group networks were contributors to an increase of social capital.

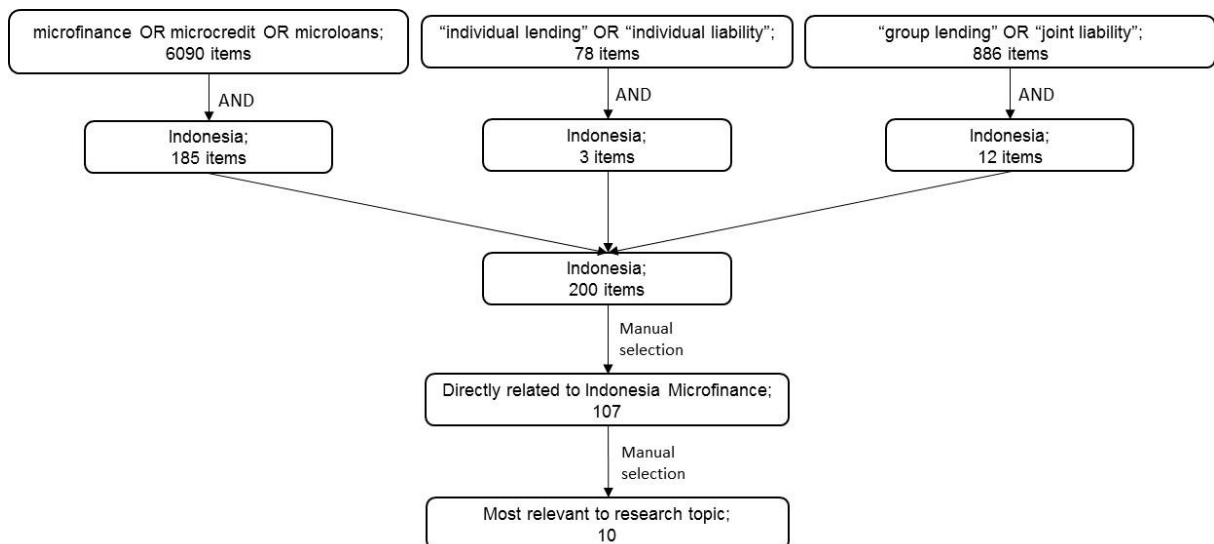
Many Indonesian women are landless (Panjaitan-Drioadisuryo & Cloud, 1999). Land titles in households are usually kept by the husband. This may restrict women's access to loans that require land collateral, commonly for individual lending. Although the study was not conducted in the same province as the present study, Ratnasari, et al., (2020) found that access to land for women headed households in West Java province of Indonesia is limited due to multi-layered exclusion powers. These layers include nuclear and extended family, peasant community and local village government, organizations including NGOs, and national agrarian regulation. At the nuclear and extended families, social and gender roles can be the reasons for exclusion of women headed households to arable land. The study found that although a woman has utilized an arable land for many years with her parents, she can be denied accessing the land by her families when her parents have died. At village community or government level, household headed by female has lower bargaining position than household headed by male. The household also experienced ignorance from the surrounding neighbours and the local government. They are often uninformed about receiving government supports such as for children education, health care, and financial assistance. Such economic pressures made the bargaining power of the household is lower in relation to land uses or access. At organization level such as NGOs that promote the land rights for landless peasants, the women headed households have not been focus of the NGOs. The NGOs on that areas have not had appropriate approaches and strategies to deal with landless women headed households. The study also found that some women seldom attend meeting with NGOs or other organizations since they are unconfident to come to such meeting or too busy with domestic duties. Last, at state or national regulation, women headed households particularly landless women have not been main priority of the agrarian reform policies. There are only one third of land certificates owned by females in Java, Indonesia (Brown, 2003). The study found that land registration and legal and social barriers impede women's access to land. Although Indonesian land regulation gives equal rights to own land title for both men and women, the women have limited knowledge about the land registration. Women ownership of land is lower than men in

some less developed countries such as Nigeria, Tanzania, Uganda, Tajikistan, and Ethiopia (Doss, Meinzen-Dick, Quisumbing, & Theis, 2018). In other developing countries, women land ownership is bigger than men such as in Vietnam and East Timor. However, the study data shows that there are more countries whose proportion of female owning lands are bigger than the male proportion. Disparity in regulation on land and family may have contributed to this. Family regulation can include regulations about marital property and inheritance. According to a study of Dower & Potamites (2010), the data from a survey in six provinces in Indonesia including two provinces in Java island, show that the land title ownership is an important factor to obtain loans from banks. The land title gives a signal to the lenders about a household's ability of loan repayment.

3.4.5 Related literature on Indonesian microfinance

The present research compares the outreach-sustainability relationship between individual lending and group lending of Indonesian formal microfinance institutions. Little is known about this topic in the current available literature. The literature search strategy for this purpose can be seen in Figure 3.3. The main database was www.scopus.com. Four steps were performed to optimise the search results on Indonesian microfinance literature related to the topic of this research. The keywords were searched within three fields in the dataset: title, abstract, and keywords.

Figure 3.3 Search strategy for Indonesian microfinance literature



In the first step, all literature related to microfinance (and synonyms), individual lending (and synonyms), and group lending (and synonyms) were selected from the database. In the second step, the keyword of “Indonesia” was added to each of the three groups. This resulted in 200 items of literature. Third, the researcher manually assessed the 200 articles to determine whether or not the literature was relevant to Indonesian

microfinance. This step resulted in 107 items of literature that were highly related to Indonesian microfinance. In the last step, the researcher manually assessed the relevance of the 107 items to the research topic and found the 10 most relevant articles. From 107 items of literature, four types of microfinance were found in Indonesia as shown in Table 3.3.

Table 3.3 Types of microfinance institution

No	Types	References
1	Rural Banks or the People's Credit Bank	<ul style="list-style-type: none"> • Erwin, Abubakar, & Muda, 2018; • Hamada, 2010; • Masyita, 2017.
2	Islamic-based microfinance including Baitul Maal wat Tamwil (BMT) and saving-loan cooperatives	<ul style="list-style-type: none"> • Fitriasari & Dalimunthe, 2019; • Husaeni & Dew, 2019; • Masyita, 2017; • Maulana, Razak, & Adeyemi, 2018; • Murti, Rokhim, & Viverita, 2018; • Wediawati, Effendi, Herwany, & Masyita, 2018; • Wijaya, Hakim, Saputro, & Mulyadi, 2019; • Wulandari, 2019
3	<i>Kredit Usaha Rakyat</i> which is a government guaranteed credit program distributing loans from state-owned commercial banks	<ul style="list-style-type: none"> • Adam & Lestari, 2017; • Farida et al., 2018; • Farida, Siregar, Nuryartono, & Eka Intan, 2016; • Farida, Siregar, Nuryartono, & Intan, 2015; • Purmiyati, Berma, Talib, & Rakhima, 2019; • Tambunan, 2017
4	Village units of Bank Rakyat Indonesia	<ul style="list-style-type: none"> • Hartungi, 2007; • Henley & Boomgaard, 2009; • Masyita, 2017; • Mulyati & Harieti, 2018; • Pasila, 2019; • Patten, Rosengard, & Johnston, D. E., 2001; • Seibel, Rachmadi, & Kusumayakti, 2010; • Tambunan, 2017; • Wardhono, Modjo, & Utami, 2019

Mosley (1995) investigated the use of incentive mechanisms for individual loans as an alternative to joint-liability group loans in three microfinance institutions in Indonesia, all of them government-owned micro lenders. The incentives included performance-based refunds, increase in loan sizes, and rebates. The study found the incentives mechanism were positively related to the repayment performance of borrowers. Two of three microfinance institutions had better outreach, with a higher percentage of borrowers below the poverty level. However, these microfinance institutions were highly dependent on subsidies.

Group lending has been used in the Indonesian rural lending. Panjaitan-Drioadisuryo and Cloud (1999) described a successful collaboration project of FAO and the Indonesian government, to provide financial and non-financial assistance to females in various rural economic sectors. The financial assistance was given to groups of female borrowers. The peer pressure in group loans ensured a high repayment rate. The report advised that this program has successfully empowered poor women in the project areas. Women enjoyed improvements in income, nutrition, children's education, and decision making. Group lending has successfully been applied in lending to rattan craftsmen in Medan city of Indonesia (Siregar & Handri, 2017). It was found improvement in loan performance was a result of strong social ties in the group, peer monitoring, joint liability, and group punishment.

Seibel and Parhusip (1998) described a rural bank in Yogyakarta, Indonesia. This is a private, non-subsidised bank that provides individual and group loans. Per December 1995, the bank had 12656 borrowers and 6200 of them were group borrowers. The group lending uses peer guarantee and peer pressure as collateral. This bank has been operating since 1970. This report shows a private commercial bank that is successful in provision of credits to low income people and in maintaining sustainability. The bank is regulated under Indonesian banking regulations instead of microfinance regulations as described by Mulyati and Harieti (2018). According to Moechdi, Ismail, Ananda, and Yustika (2016), interest rate spread and capital are the highly significant determinants of rural banks' sustainability in Indonesia.

There are several programs developed by central or local government to provide credits to poor people and small businesses. Farida et al. (2015) searched for determinants of access to credits from an Indonesian government-supported program—namely *Kredit Usaha Rakyat (KUR)*—that distributes loans from commercial banks to unbankable small businesses with subsidised interest rates and credit guarantee. The study was conducted in Central Java Province and found that the likelihood of men obtaining loans from the KUR is higher than women. The authors contend that asset/property ownership, banking-related experience and education are the main reasons for the smaller likelihood of women accessing the KUR loans. Furthermore, UED-SP is another government program which is fully funded by local government. Rifai, Khoon, and Nyen (2019) investigated outreach and sustainability of *Unit Ekonomi Desa – Simpan Pinjam (UED-SP)* in Riau Province, Indonesia. This is a government funded program that provides deposit and loan services for poverty alleviation and development of the rural economy. The study found that the program achieved the social goals sustainably after six years

of operation. The authors argue that an important factor of the success is the availability of clear operational guidance on lending practices provided by the authority.

Juwita, Majid, and Sychalad (2018) explored the link between loan overall performance and interest rates, deposits, and loan amounts. The data was from BRI bank, a large commercial state-owned Bank. The study found that interest rates are negatively correlated with loan performance. Total amount of loans and deposits are positively correlated with performance.

Worokinasih and Potipiroon (2019) examined the relationship between social capital, business performance, loan terms and loan performance of sample borrowers of *Koperasi Jasa Keuangan*, a cooperative microfinance institutions in East Java, Indonesia. The study found that social trust between microfinance lender and the borrower has a strong correlations with lending performance. Loan terms are indirectly related to loan performance via business performance.

3.5 Gender and loan terms (interest rates and loan amounts)

Discrimination can occur because of differences in personal judgment upon other individuals or groups, or statistical differences such as capital (Pham & Talavera, 2018). Discrimination can occur in many markets, such as differences in wages in the labour market (Becker, 1971) and credit market (Cavalluzzo, Cavalluzzo, & Wolken, 2002). Although the current research does not focus on the issue of gender discrimination, it becomes relevant because the inclusion of female borrowers is a success indicator of microfinance social goals. Little of the literature investigates the relationship between gender and lending, especially in the micro credits market. This section will review literature about gender and its relationship to loan terms, including interest rates and loan amounts that are determined by the lender.

3.5.1 Gender and interest rates

Is there any interest rate discrimination in the credit market? Cavalluzzo et al. (2002) explain that the lender may determine the interest rates under an imperfect information market regardless of the gender differences, and thus credit rationing may prevail. This is costly to the lender because it is easy to identify and can cause an expensive litigation process. Empirical evidence on gender differences in interest rates is still inconclusive.

Peterson (1981) found no evidence of gender discrimination in bank consumer loans in the US. The study contends that banks determined the loan terms to maximise profit by minimising credit risks irrespective of the gender differences. This was supported by evidence from Cavalluzzo et al. (2002) that found no evidence of interest rate

discrimination against a particular gender for credit to small business owners based on data from the National Survey of Small Business Finances in the US. But the study found evidence of differences in credit denial rates between white males and African American. Using peer-to-peer lending market data in China, Chen, Li, and Lai (2017) found evidence of two types of discrimination, including taste-based and profit-based. On one side, women were more favoured by profit-based lenders as they had higher probability of repayment. On the other side, women paid higher interest rates to taste-based lenders.

Dorfleitner et al. (2013) investigated the determinants of microfinance interest rates using world data of 712 institutions. The study found that men pay lower interest rates than women after taking into account factors related to institutional differences and country specific characteristics. The interest rate differences are more apparent in African microfinance. However, this does not have to mean that microfinance discriminates interest rates by gender. Further analysis is required on the relationship between interest rates and gender.

A study of Basharat, Hudon, and Nawaz (2015) found evidence that female borrower-dominated microfinance institutions are associated with higher interest rates because of the smaller loan sizes. Operating expenses were relatively higher for small loans than bigger loans. The expenses were covered by higher interest rates. The findings were based on the data of 291 microfinance institutions in 67 countries.

Asiedu, Freeman, and Nti-Addae (2012) found little evidence of differences in interest rates between different genders and races in the data of a national survey in the US from 1998-2003. White male borrowers paid higher interest rates than white female borrowers.

Pham and Talavera (2018) analysed data of SMEs in Viet Nam and investigated the relationship between social capital, gender and credit access. The study found that men pay higher interest rates and have lower probability of loan approval than women. Males have greater social capital in terms of business networks, while women can build better mixed networks with males. Women may also gain more advantage than men from community networks to access credit, as evident in Indonesia (Okten & Osili, 2004).

Meyer (2019) found a significant positive relationship between gender and yield on portfolio from an analysis of data of 1,805 microfinance institutions. Microfinance that serves only female clients is associated with 0.083 higher portfolio yield. More barriers to loan access for females can explain the increase of yield.

3.5.2 Gender and loan size

A few studies on gender relations and loan size in microfinance can be found. The difference in loan size between women and men is not necessarily caused by discrimination. The scale of the project and other factors might be the cause of the difference. For example, Agier and Szafarz (2013) analysed data from Brazilian microfinance and found no significant differences in loan approval likelihood by gender, but found differences in loan amounts by gender and this did not correspond to the scale of the borrower projects. However, Corsi and De Angelis (2017) did not find evidence of discrimination against gender in loan sizes based on microfinance data in Uganda. The differences in loan size between males and females were affected by borrower characteristics and history of previous credits.

3.6 Relationship of interest rates and loan repayment

Interest rate can have two effects (Stiglitz & Weiss, 1981). First, it has a selection effect in that high interest rates are associated with high risk borrowers as it needs a riskier project to generate a higher rate of return. Second, it has an incentive effect, encouraging borrowers to take on a project based on the level of interest rates. These effects influence the lender expected rate of return, as shown in Figure 3.1. The optimal level of interest rates is r^* , which maximises the expected rate of return. Any interest rates beyond that level will end up with higher risk borrowers, riskier borrower projects, and suboptimal rate of return.

Kodongo and Kendi (2013) found evidence of a positive relationship between interest rates and likelihood of default. An increase of interest rates by 1% means the likelihood of default rise 6.5 times. The borrower has to earn more income from riskier projects to repay the loan. This is also in line with a study of Danstun and Harun (2020) indicating that the portfolio at risks (PAR) increases by 0.061 as the interest rates rise by 1 unit. The authors argue that loan costs burden and moral hazard might contribute to that relationship. This finding was based on survey data from 219 respondents in three regions in Tanzania.

In contrast, Kar and Swain (2014) found interest rates were positively associated with loan performance in the data of 379 microfinance institutions in 71 nations. However, there is a threshold interest rate in individual lending where the loan performance decreases when interest rates are beyond the threshold. Di Martino and Sarsour (2012) also found 1 unit increase of interest rates would associate with a 0.37 decrease of PAR, in data from a microfinance institution in Palestina.

Awaworyi Churchill (2018) examined the relationship between interest rates and profitability of African countries' microfinance, specifically to find the existence of threshold interest rates. The study found no evidence of a threshold interest rate that can cause deterioration of loan portfolio quality. The author argued that the threshold does not exist because of the high growth rate of sub-Saharan African economies or the lending method.

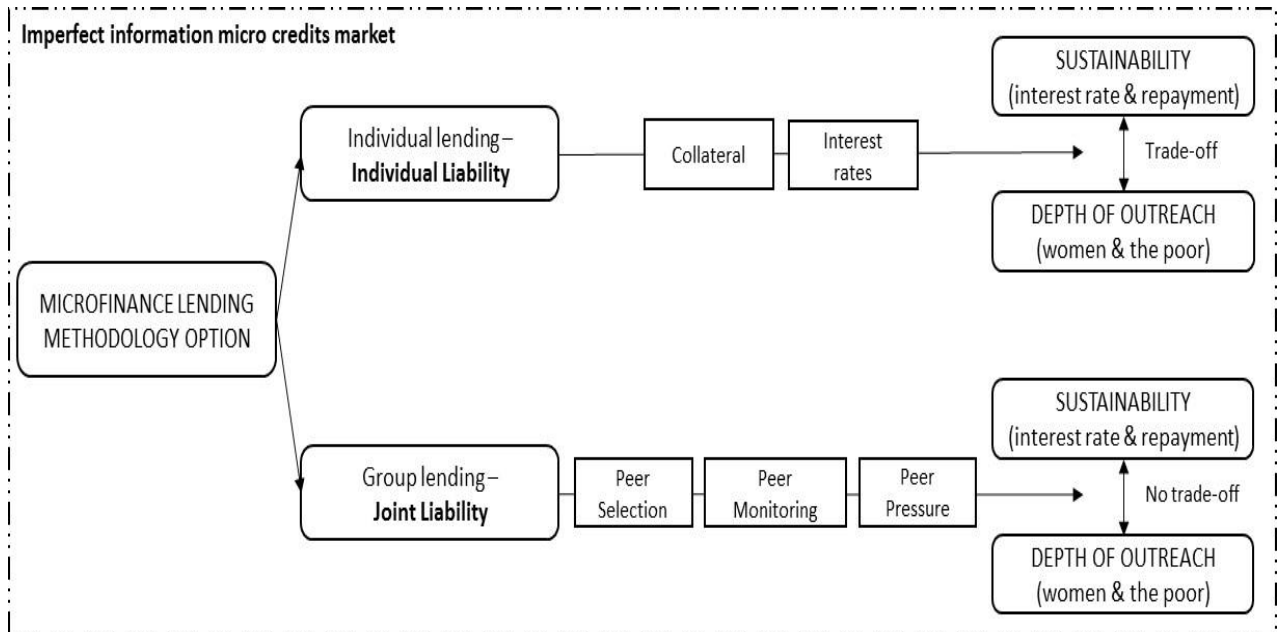
3.7 Conceptual framework

Based on the review of literature, the present study proposes a conceptual framework as shown in Figure 3.4. Microfinance institutions are expected to achieve dual objectives, achieving depth of outreach and maintaining sustainability (Brau & Woller, 2004; Conning, 1999; Morduch, 2000; & Robinson, 1995). The depth of outreach is indicated by the borrower poverty level and the number of female borrowers. While keeping the effort to achieve these social objectives, the institutions are also expected to be able to maintain the lending sustainability without dependencies on government subsidies or donors' support. It can be achieved if the institutions are able to generate sufficient interest revenues to cover operational costs and to maintain low level of bad performance loans. The framework connects microfinance lending methodology to sustainability and depth of outreach. The research examines this connection under the assumption of an imperfect information market. Imperfect information in a rural credit market can cause market failure (Hoff & Stiglitz, 1990; Nicholson, 2002; Stiglitz & Weiss, 1981). Adverse selection and moral hazard have caused difficulties in borrower selection, monitoring and enforcement (Hoff & Stiglitz, 1990). Collateral cannot be used as a screening and enforcement tool because most borrowers in rural credit markets are lower income people and lack asset collateral (Van Tassel, 1999). Charging interest rates to borrowers to compensate higher risks and to screen out untrustworthy borrowers may cause adverse selection and moral hazards (Stiglitz & Weiss, 1981). Lenders could end up with high risk borrowers and reduce the portfolio's expected returns.

Microfinance has both social and financial goals (Asian Development Bank, 2000; Beck, 2015). Microfinance institutions achieve social goals if the lending reaches the poorest people and women (Arrassen, 2017; Hossain et al., 2020; Meyer, 2019; Quayes, 2015; Reichert, 2018). The financial goal of microfinance is to achieve profitable and sustainable operation without reliance on subsidy (Conning, 1999; Von Pischke, 1996). However, social and financial goals might be conflicting, especially in an imperfect information credit market where borrower information is scarce and collateral may not be available (Van Tassel, 1999). Conventional individual lending to achieve outreach may lead to the unsustainable operation of microfinance (Awaworyi Churchill, 2018, 2019;

Louis & Baesens, 2013; Necesito, 2016; Pedrini & Ferri, 2016). Microfinance needs an alternative lending methodology to make the conflicting outcomes of social and financial goals diminish.

Figure 3.4 Conceptual framework



Group lending with joint liability can induce peer selection, peer monitoring and peer pressure amongst the group members (Besley & Coate, 1995; Islam, 1996; Stiglitz, 1990; Varian, 1990). Peer selection can reduce lender costs in screening borrowers (De Aghion & Gollier, 2000). It also utilises local or private information of members for assortative matching (Ghatak, 1999). Peer monitoring can minimise lender monitoring costs and strategic default, and reduce interest risks (de Aghion, 1999; Islam, 1996). Peer pressure is induced by imposing sanctions on the group to minimise the possibility of voluntary default (Besley & Coate, 1995). These group mechanisms may improve the market by minimising market failure and eventually eliminate the trade-off between microfinance depth of outreach and sustainability.

The conceptual framework helps to show the proposed link between microfinance objectives of depth of outreach and sustainability with the lending methodology. It argues that group lending can minimize the information asymmetry problems in lending to achieve the microfinance objectives simultaneously. Meanwhile, it is also argued that microfinance loans with individual lending may lead to a trade-off between the depth of outreach and the microfinance sustainability. The group lending enforces peer selection, peer monitoring and peer pressures to reduce the problems. In addition to comprehending the lending methodology of Indonesian microfinance institutions, the present study examines to what extent the lending methodology influences the

relationship between the depth of outreach and the microfinance sustainability. Two empirical models were developed in Chapter 4 to achieve this goal by examining the effect of depth of outreach on two indicators of sustainability. The first model is to examine the effect of depth of outreach on interest rates. The second model is to examine the effect of depth of outreach on loan default probability.

3.8 Conclusion

This chapter has discussed three main concepts including sustainability, outreach and lending methodology. Six main conclusions of this chapter are as follows:

1. Lending in the rural market is characterised by imperfect information that can lead to market failure. Microfinance institutions are operating in this type of market where classical market theories may not apply. There is a considerable gap in information between borrowers and lenders that can lead to market inefficiency.
2. Traditional individual lending may impede microfinance in achieving social and financial goals. There is trade-off between depth of outreach and sustainability of microfinance. Individual lending to poorer borrowers or to women borrowers might affect microfinance interest income and/or increase portfolio risks.
3. Gender may have an effect on loan terms in terms of loan interest rates and loan amount. There are few studies that have investigated this issue in the microfinance literature.
4. Interest rates can have an impact on repayment by the borrowers. According to credit rationing theory, there is an inverted U-shaped relationship between interest rates and expected rate of return from a lending portfolio. Interest rates higher than an optimal rate may lead to adverse selection and moral hazard behaviour of the borrowers. These effects can decline the expected rate of lender returns.
5. Basically, there are two type of microfinance lending methodology: individual lending and group lending. Group lending is an innovative lending popularised by Mohammad Yunus the founder of the Grameen Bank in Bangladesh. The group use joint liability that can induce peer selection, monitoring and pressure by the members.
6. Group lending may improve the credit market and affect the relationship between depth of outreach and sustainability. Some studies have investigated the difference between individual lending and group lending in terms of sustainability and the depth of outreach. There is a lack of studies on this topic in relation to the Indonesian context.

CHAPTER 4 RESEARCH METHODOLOGY

4.1 Introduction

This chapter revolves around the details of methods applied to examine the relationship between lending outreach and lending sustainability of the Indonesian microfinance institutions, as well as the role of lending method in the relationship. This study is approached with a mixed methodology that combines both quantitative and qualitative methods to accomplish the research objectives. The quantitative methods apply statistical regression to test the relationship between lending outreach and lending sustainability. The qualitative methods use thematic analysis to apprehend the details of Indonesian MFI lending.

The structure of this chapter begins with Section 4.2 explaining a general conceptual framework of this study. Section 4.3 will explain the research paradigm and will justify the use of mixed methodology, research site selection and data collection methods. The next two sections, 4.4 and 4.5, will explain in detail both quantitative and qualitative methods respectively. The involvement of humans as respondents in this study requires a research ethics approval and this will be clarified in Section 4.6. The last section will sum up the content of this chapter.

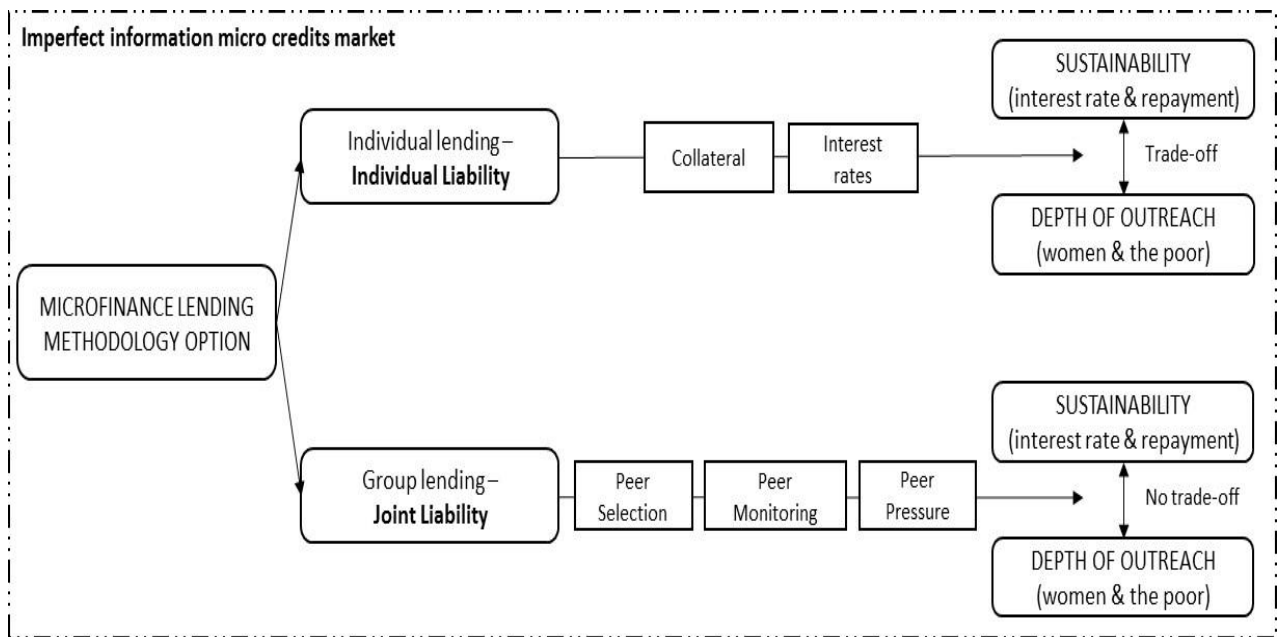
4.2 Conceptual framework

This section reiterates the proposed conceptual framework in the Literature Review Chapter (see Figure 4.1). The framework connects microfinance lending methodology to sustainability and depth of outreach. The research examines this connection under the assumption of an imperfect information market.

Microfinance institutions achieve social goals if the lending reach the poorest people and women. Social and financial goals might be conflicting, especially in an imperfect information credit market where borrower information is scarce and collateral may not be available.

Group lending with joint liability can induce peer selection, peer monitoring and peer pressure within the group members. These group mechanism may improve the market by minimising market failure, and eventually eliminate the trade-off between microfinance depth of outreach and sustainability.

Figure 4.1 Conceptual framework



4.3 Research paradigm and design

Apart from being determined by the nature of the research problems being studied, the choice of methodology and research design is largely determined by the philosophical assumptions chosen by the researcher (Creswell, 2014). This philosophical assumption is the basic orientation or belief which is the foundation of researchers in understanding the world and the knowledge that will guide researchers in how to answer research problems. According to Creswell, the choice of methodology is also influenced by the background of the scientific discipline that the researcher has, by the influence of the research supervisors and the experiences in previous research.

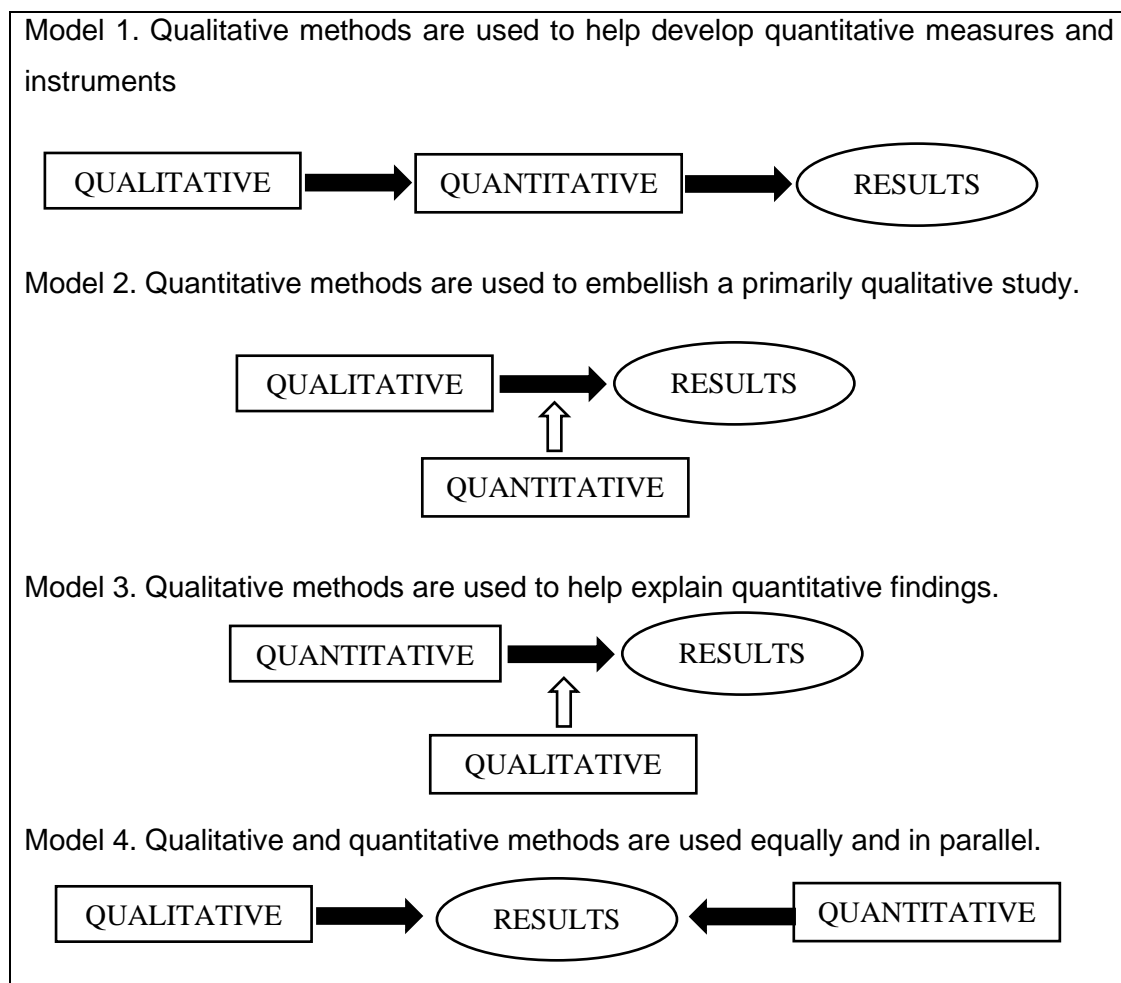
4.3.1 Mixed Methods

A mixed methods approach is a further development of the triangulation concept that integrates the superiority of each methodology (Jick, 1979). Based on several definitions from leading scholars in mixed-methods, R. B. Johnson and Onwuegbuzie (2007, p. 123) summarise them into a general definition as follows:

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration.

There are several models of the mixed methods design approach. One of the approaches is simultaneous triangulation and sequential triangulation (Morse, 1991). Simultaneous triangulation is a mixed methods approach where qualitative and quantitative methods are used simultaneously. Sequential triangulation uses a different approach, where a method is prioritised to be implemented first and followed by the other approach. Another approach is proposed by Steckler, McLeroy, Goodman, Bird, and McCormick (1992) that consist of four mixed methods models (see Figure 4.2). The first model uses qualitative methods to help design the instruments that will be used in quantitative methods. The second model mainly uses quantitative methods. Qualitative methods are used to explain the results of quantitative findings. On the contrary, the third model mainly applies qualitative methods while quantitative methods are used to explain results obtained from qualitative methods. Finally, the fourth model uses qualitative and quantitative methods in parallel.

Figure 4.2 Mixed methods procedures



A parallel mixed method design will be adopted in the present study. The quantitative method has a greater proportion and emphasis than the qualitative method. The qualitative method is used to help explain the results of the quantitative method. This design is chosen for the reason that there are several theories have been developed about sustainability and outreach of microfinance, group lending and relationship lending. Therefore this study is focusing more on testing the existing theories. The qualitative method is used to give further explanation utilising the data from interviews with the management of microfinance. The data collection was conducted concurrently while the analysis of both qualitative and quantitative data was carried out individually.

A mixed methodology has been used in many microfinance studies. Nazirwan (2015) applied mixed methods to comprehend the operation of Islamic microfinance institutions and the integration of the institutions into the surrounding community and economy. The study was a longitudinal study in the context of Islamic community-based microfinance institutions (*Baitul Maal Wat Tamwil*) in the city of Yogyakarta, Indonesia. Arsyad (2005) used quantitative methods triangulated with qualitative methods (descriptive and SWOT analysis) to understand performance and sustainability of microfinance with a case study of Village Credit Institutions in Bali, Indonesia. Fitri (2006) explored credit behaviour of small farmers in three villages in West Sumatera province, Indonesia. This study employed mixed methods research with descriptive quantitative analysis and thematic qualitative analysis.

In addition, relying solely on quantitative data may be inadequate to capture all relevant information about the microfinance lending practices. The quantitative data in this study was supplied by microfinance institutions that have limited databases about the loan details. Therefore, quantitative results complemented by the qualitative information from interviews with microfinance managers can enrich the analysis.

4.3.2 Research site selection

The study was carried out in Central Java province, Indonesia. The study was carried out in Central Java province, Indonesia. This province covers an area of 32,548 km². It is rather smaller than the other two provinces in the Java island (East Java and West Java), 47,923 km² and 43,177 km² respectively. The province consists of 29 regencies and 6 municipalities. The total population in this province in 2019 is 34.7 million people (Badan Pusat Statistik Jawa Tengah, 2020).

All provinces in Java island including Central Java are highly populated with density around 500 to 1000 per square km of area. The proportion of female and male are almost

equal, 17.5 million and 17.2 million respectively. Poverty rate of the province (10.9%) is higher than national poverty rate of 7.38%.

Gross domestic product (GDP) at current prices in 2019 was Rp1.36 trillion (provisional figure). It contributes to 8.68% of total 34 provinces GDP in Indonesia. This number is lower than GDP of several major cities in Java island including Jakarta, West Java and East Java. The GDP is growing at 5.41% per year. Three major economic sectors that mostly contributes to the Central Java's GDP are manufacturing, agriculture/forestry/fishing, and wholesaler/retailer.

Five major religions in the provinces are Islam, Christian, Catholic, Hindu, and Buddha. More than 35 million population of Central Java province are muslim, About 34 million or more than 97% of the Province's population are muslim. The other two major religions that have large believers are Christian and Catholic, 677 thousand and 501 thousand respectively.

Many lending institutions are operating in the province. There are more than 22 thousand financial cooperatives with total of 7.8 million members. Rural banks have grown quite rapidly in this province with a total of 278 banks, consisting of 252 conventional banks and 26 sharia banks. Apart from rural banks, commercial banks also grew well with a total of 62 banks, consisting of 52 conventional banks and 10 sharia banks. Although majority of the population are muslim, sharia banks and cooperatives are not the dominant banks in the Province. Many of the muslim may use conventional banks or cooperatives to make loans or do other financial transactions.

There are at least two reasons why this province was the selected study area. This study was investigating group lending which might be influenced by cultural aspects. Focusing on lending practices in one area might be able to control for the cultural differences of peoples who are selected as the sample of this study.

Time and costs constraints were another consideration of choosing this province. More than 70% of microfinance institutions are located in this province, which covers an area of 32.548 km². Restricting the study area in this province minimised the time and costs to collect data from the selected microfinance.

4.3.3 Data collection methods

There are several common data collection methods. Tashakkori and Teddlie (2003) outline six methods in social and behavioural research. First, a questionnaire method is a self-reporting method by the participant. It can be used in both qualitative and quantitative research. Second, an interview is similar to a questionnaire in that it can be

used for both quantitative and qualitative research. It provides the opportunity for the interviewer to seek more detailed information from the participant. Third, focus group discussion is conducted by the researcher in a group consisting of 6 to 12 people coordinated by a moderator. The interactive conversation between the participants can provide useful insights about an issue. Fourth, a test is a standardised method of data collection and is usually used for quantitative research. This type of data collection has strong measurement validity. Fifth, an observation is where the object of research is observed, both in natural and/or structured settings. Lastly, secondary data is a method that gathers data from that previously collected by other persons. The initial collection of the data may have had a different purpose from the researcher's purpose.

Some of those methods are commonly used in studies about depth of outreach and sustainability of microfinance. Many of the studies have used secondary data from Microfinance Information Exchange database (MIX database) that provides various financial data of microfinance institutions from world countries (such as Mia & Chandran (2016); Danstun & Harun (2020); Churchill (2019); Al-Azzam & Parmeter (2019); and Abrar (2019)). Other studies relied on secondary data from one or more microfinance institutions. For instance, Mahmud, M. (2019) uses data from 14 branches of a microfinance institution in Lahore, Pakistan, to investigate borrower behaviours under joint liability group lending. Juwita, et al. (2018) employed panel data to explore determinants of loan performance from a large micro lender in Indonesia, BRI bank. Interview is also a common method of data collection in this kind of studies. For example, a study of Townsend (2003) interviewed 262 group lending in 192 villages to investigate individual and group lending mechanisms of microfinance institutions in Thailand. Attanasio, et al. (2019) interviewed 961 women to investigate the demand for different liability arrangements and risk environments in Mongolia.

In this study, two different data collection methods were selected. The quantitative analysis used the secondary data method and the qualitative analysis used interviews as the method. The secondary data was selected for the reason that most information needed for the analysis is available from data gathered by the microfinance institutions. Although it might not cover all the information as needed, the data is sufficient to answer the research questions of this study. Primary data collection can be time consuming and costly. It will require a considerable amount of time and financing to visit the microfinance borrowers in remote village regions. Questionnaire data collection via post office would also not be effective since the questionnaire needs to be explained to the respondents. Meanwhile, the qualitative analysis made use of data from interviews with the sample of microfinance institution managers.

4.4 The quantitative analysis

This section will explain the detailed methods of this study for quantitative analysis in Chapter 7. This section will cover all the technical details, including hypotheses development, defining population, defining unit of analysis, sampling strategy, and analysis methods.

4.4.1 Hypotheses development

A hypothesis is "...the formal statement of the researcher's prediction of the relationship that exists among the variables under investigation." (Johnson & Christensen, 2014, p. 101). Quantitative hypotheses attempt to predict the outcome of a relationship between variables (Creswell, 2014). These can be directional or non-directional hypotheses. Directional hypotheses state whether the relationship is greater or smaller, whereas, non-directional hypotheses only state whether or not there are relationships between the variables. Hypotheses were tested with the appropriate statistical techniques using the empirical data collected during the fieldtrip. Hypotheses were developed to address the research objective of comparing the relationship of depth of outreach and sustainability between individual and group lending. In the discussion that follows, the relevant literature is revisited to support the proposed hypotheses.

4.4.1.1 Depth of outreach and interest rates (Hypotheses 1 to 4)

Hypotheses 1 to 4 examine the relationship between depth of outreach and interest rates in two lending methodologies: group and individual lending. Group lending borrowers pay lower interest rates than individual lending borrowers. Assortative matching of group members persuades the members to find a partner who has a project with the same likelihood of success (Zhao & Gao, 2011). This will decrease the monitoring costs, as was evident in Bratton (1986) in Zimbabwe. The group mechanism also provides lower interest rates and increases the likelihood of credit approval. Data from a micro credits program in Zimbabwe revealed that the group liability lending had smaller administrative costs (Bratton, 1986), although this did not occur in the micro credits in Bolivia (Ladman & Afcha, 1990). In addition, lending to individuals has higher screening costs for the lenders than peer selection in group lending (Navajas et al., 2003). A theoretical model of Arnold et al. (2013) demonstrates that although group lending creates larger deadweight loss than individual lending, it has lower interest rates. Using data of 420 clients from 38 microfinance institutions in Kenya, Kodongo and Kendi (2013) compared individual and group lending. They found that interest rates of group loans were lower than individual loans.

Relationship between loan sizes and interest rates

The interest rates are negatively correlated with loan sizes which is commonly used as proxy of borrower income. Nwachukwu et al. (2018) investigated determinants of interest rates using data of 300 microfinance institutions from 107 developing countries. The study found that wealthier borrowers, as indicated by larger loans, are associated with lower interest rates. The authors argue that larger loans are more cost efficient to microfinance due to lower administrative and bad debt expenses. Eventually, efficient microfinance can charge lower interest rates to borrowers (Basharat et al., 2015). Microfinance requires higher operational costs to administer and to collect small loans relative to larger loans (Rosenberg et al., 2013). The costs are taken into the calculation of lending interest rates.

Borrower income or loan size is negatively correlated with interest rates. If the loan occurs in group lending, the correlation between loan size and interest rates may be different from that with individual lending. Group lending has lower monitoring costs and lower costs for borrower selection (Bratton, 1986; Navajas, Conning, & Gonzalez-Vega, 2003; and Zhao & Gao, 2011). The selection and the monitoring are performed by the group peer mechanism. It reduces the operational costs of the lenders that eventually can lower the interest rates. Hypotheses 1 and 2 were developed to test the relationship between loan size and interest rates for Indonesia in the two lending methods, individual lending and group lending.

H1: Loan size (ILA) in individual lending is correlated with the interest rates (IRP).

H2: Loan size (ILA) in group lending is correlated with the interest rates (IRP).

Relationship between gender and interest rates

Cavalluzzo et al. (2002) argue that the lender may determine the interest rates under an imperfect information market regardless of the gender differences, and thus credit rationing may prevail. This is costly to the lender because it is easy to identify and can cause an expensive litigation process. Empirical evidence on gender differences in interest rates is still inconclusive. Peterson (1981) found no evidence of gender discrimination in bank consumer loans in the US. The study contends that banks determined the loan terms to maximise profit by minimising credit risks irrespective of the gender differences. This was supported by evidence from Cavalluzzo et al. (2002) that found no evidence of interest rate discrimination against a particular gender for credit to small business owners based on data from the National Survey of Small Business

Finances in the US. But the study found evidence of differences in credit denial rates between white males and African Americans.

Using peer-to-peer lending market data in China, Chen et al. (2017) found evidence of two types of discrimination, including taste-based and profit-based. On one side, women were more favoured by profit-based lenders as they had a higher probability of repayment. On the other side, women paid higher interest rates to taste-based lenders.

Dorfleitner et al. (2013) investigated the determinants of microfinance interest rates using world data of 712 institutions. The study found that men pay lower interest rates than women after taking into account factors related to institutional differences and country specific characteristics. The interest rate differences are more apparent in African microfinance. However, this might not mean that microfinance discriminates interest rates by gender. It requires further analysis on the relationship between the interest rates and gender.

Asiedu et al. (2012) found little evidence of differences in interest rates for different genders and races in data of a national survey in the US from 1998-2003. White male borrowers paid higher interest rates than white female borrowers.

To conclude, female borrowers are associated with lower loan interest rates than male borrowers. Lending methodology may change the association between gender and interest rates. Hypotheses 3 and 4 were developed to test the association between gender and interest rates for Indonesia in the two lending methods, individual lending and group lending.

H3: Gender (SEX) in individual lending is associated with interest rates (IRP).

H4: Gender (SEX) in group lending is associated with interest rates (IRP).

4.4.1.2 Depth of outreach and loan performance (Hypotheses 5 to 8)

Hypotheses 5 to 8 examine the relationship between depth of outreach and loan performance in two lending methodologies, group and individual lending. Joint liability group lending is expected to reduce adverse selection and the moral hazard problem of lending in an imperfect information market. It imposes peer selection, group monitoring and group sanctions to improve repayment. There are several studies comparing loan repayment between group lending and individual lending.

Group lending with joint liability has higher repayment rates than individual lending (Bratton, 1986). The outcome can be more enhanced by stricter group sanctions than peer selection mechanisms. However, Calidoni and Fedele (2009) suggest that people

in urban areas are characterised by lesser local information and social punishment, which make joint liability lending a less effective way to improve loan repayment. Their theoretical model demonstrates that the best possible approach to lending to people without collateral in urban areas where there is lack of local information and social sanction, is the provision of loans through a combination of cooperatives and the cooperative association, as implemented in three Northern Italian microfinance institutions. Profit maximisation motives in single projects carried out by several borrowers can have higher loan repayments than multiple projects' borrowing.

A theoretical model of Jeon and Menicucci (2011) focused on "state non-contingent" repayment liability of the Grameen Bank. With that liability, borrowers must repay loans regardless of any shocks. The "state contingent liability" will give insurance to the borrower in case of shocks. However, insurance on individual shocks might create agency costs. Their model demonstrates that individual lending has poorer repayment rates than group lending after taking into account contingent insurance or verification costs.

In contrast, Ladman and Afcha (1990) found no improvement in repayment of joint liability lending based on data from micro credits in Bolivia. Nevertheless, group lending increased the likelihood of loan approval and offered more technical assistance than individual lending.

An experiment by Abbink et al. (2006) with university students in Germany found that group lending repayment rates are higher than individual lending. Differences in group size and social connectedness among the borrowers did not significantly affect the performance of group lending. This finding is not supported by evidence of a natural experiment of microfinance in Pakistan (Mahmud, 2019). The individual lending was converted into joint liability group lending. The study found pre-existing social ties of the members contributed to improvement in group lending performance.

Cason et al. (2012) carried out an experiment in two universities in Australia and one university in India. The study found that when group monitoring costs are lower than lender monitoring costs, group repayment rates are better than individual lending repayment rates. The repayment rates are the same when there is no difference in monitoring costs. Furthermore, the study found no differences in repayment performance between simultaneous group lending and sequential group lending as adopted by the Grameen Bank.

Using data of 420 clients from 38 microfinance institutions in Kenya, Kodongo and Kendi (2013) compared the performance of individual and group lending. The proportion of

default loans in group lending was smaller than for individual lending. The study found evidence that group lending could perform better than individual lending in terms of repayment. It also found that likelihood of default is positively associated with interest rates and negatively related to loan size.

A theoretical model of Sinn (2013) evaluates the performance of three types of microfinance lending, including sequential group loans, simultaneous group loans, and individual loans. It was argued that sequential loans will have the highest repayment rates if contract enforcement in simultaneous and individual loans is weak. When the contract enforcement is strong, simultaneous loans will have the highest repayment rates. This finding is slightly different with the previous evidence of Cason et al. (2012) that found no differences in repayment performance between simultaneous group lending and sequential group lending.

Arnold et al. (2013) argues that although group lending has higher repayment rates and lower interest rates, it may create larger deadweight loss than individual lending. Therefore, individual lending can be more dominant in market equilibrium.

Vigenina and Kritikos (2004) investigated differences in repayment rates between individual and group lending in evidence from Georgian microfinance. Each lending method applied a different incentive mechanism. Access to future and bigger loans was given to successful individual borrowers. Access to future loans was given to successful groups. Collateral was only required in individual loans. The study found no significant difference between those lending methodologies.

Giné and Karlan (2014) conducted two experiments in the Philippines to compare repayment performance of individual and group lending without changing the weekly repayment schedule. First, an existing joint liability group lending was changed into individual lending. Second, new individual and group lending was developed in different areas. The shift from group lending to individual lending had no impact on repayment performance but it altered the social networking of the members, leading to lesser quantity but higher quality interaction. The shift to individual lending also made members socially more connected because there was no more obligation to put pressure on other members in case of loan default. The importance of social capital can also be seen from a theoretical model of de Quidt et al. (2016) which demonstrates that repayment will not improve if joint liability is removed from group lending. This supports the finding of Giné and Karlan (2014) that repayment rates can increase even if group lending is adopting individual liability on the condition that the social capital in the group is also increased. Coleman (as cited in Worokinasih & Potipiroon, 2019, p. 31) defined social capital as

“...a valuable asset that results from access to resources made available through social relationships”.

Attanasio et al. (2014) conducted a field experiment to compare repayment rate and poverty between group and individual borrowers in rural Mongolia. The participants were randomised. The study found that participants in group lending have higher consumption and entrepreneurship than individual borrowers. There was no evidence of differences in income and repayment rates.

Jarungrattanapong (2018) conducted a field experiment in Thailand with 256 villagers. The study found a joint liability lending equipped with dynamic incentive was not associated with higher repayment. The repayment was associated with group lending with joint liability but without dynamic incentive. This finding might contribute to the previous evidence of Vigenina and Kritikos (2004) that found no significant difference of repayment rates between individual and group lending in evidence from Georgian microfinance that applied different types of incentives for individual and group loans.

Relationship between loan size and loan repayment

Borrower income as proxied by loan sizes is negatively related to default probability. Kodongo and Kendi (2013) analysed data of Kenyan microfinance and indicated that 1 unit increase of the log loan amount is associated with a decrease of default probability by 0.23. The authors argued that larger loans are associated with group lending and more experienced borrowers. These borrowers might have lower credit risks. Likewise, Worokinasih and Potipiroon (2019) found loan terms including a higher loan amount, lower interest rates and an appropriate repayment schedule are positively related to business performance, hence the loan repayment. The study was conducted in Indonesian microfinance institutions.

Furthermore, based on microfinance data in three regions of Tanzania, Danstun and Harun (2020) found a negative relationship between loan sizes and portfolio at risk (PAR). One unit increase of loan size reduces PAR by 1.487. It was interpreted that the larger loan reflects a better borrower's credibility and business experience.

Income borrower or loan size is negatively correlated to default probability. The lending method may change the correlation between loan size and repayment rates. Hypotheses 5 and 6 were developed to test the relationship between loan size and probability of a performing loan for Indonesia in the two lending methods, individual lending and group lending:

H5: Loan sizes (ILA) in individual lending are associated with the likelihood of loan collectability (COL).

H6: Loan size (ILA) in group lending are associated with the likelihood of loan collectability (COL).

Relationship between gender and loan performance

Women have been associated with higher loan repayment rates. The Grameen Bank is an example of how lending to women can have low default rates. According to Hulme and Mosley (as cited in Abdullah & Quayes, 2016), microfinance can enhance its financial performance by focusing on female borrowers. Using panel data of 892 microfinance institutions, Abdullah and Quayes (2016) found that there is a positive association between portfolio yield and proportion of women in microfinance. This is also supported by a finding of Nanayakkara (2017) in 235 microfinance institutions from 63 countries. The paper found evidence of a positive association between the proportion of women in microfinance and microfinance performance. Adanu and Boateng (2015) found the likelihood of default for male borrowers is higher than for females based on data from microfinance in Ghana. Alam et al. (2019) analysed data from Canadian microfinance with an individual lending methodology and found that female borrowers' default rates were slightly lower than male borrowers.

Female borrowers are associated with a higher likelihood of performing loans. Lending methodology may change the association between gender and performing loan likelihood. Hypotheses 7 and 8 are developed to test the association between gender and interest rates for Indonesia in the two lending methods, individual lending and group lending.

H7: Gender (SEX) in individual lending is associated with the likelihood of loan collectability (COL)

H8: Gender (SEX) in group lending is associated with the likelihood of loan collectability (COL)

4.4.1.3 Determinants of loan sizes

Group lending with joint liability is a lending innovation to help poorer borrowers to access small loans without collateral that otherwise could not be provided by conventional individual lending. Madajewicz (2011) argues that the coexistence of group and individual lending in the microfinance market can be explained by the differences in

borrower wealth. Individual lending serves wealthier borrowers with relatively larger loans while group lending focuses more on poorer borrowers with smaller loans.

However, Yang et al. (2011) found that borrowers demand larger loans in group lending than individual lending. This is based on data from a survey of microfinance borrowers in Xinjiang Uygur, China. The author argues that the lenders provide larger loans to group borrowers because it is considered safer than individual lending. This is supported by the argument of Kodongo and Kendi (2013) that group loans are often associated with larger loan size as the loans have lower default risks.

Hypotheses 9 was developed to test the association between lending methodology and loan sizes for Indonesian data.

H9: Lending method (LME) is associated with loan size (ILA)

The second determinant to be tested was gender. There are only a few studies on this issue. Agier and Szafarz (2013) made use of data from Brazilian microfinance and found no significant differences in loan approval likelihood by gender, but found differences in loan amounts by gender, and this did not correspond to the scale of the borrower projects. Corsi and De Angelis (2017) did not find evidence of discrimination against a particular gender in loan sizes based on microfinance data in Uganda. The differences in loan size between males and females were affected by the borrower characteristics and history of previous credits.

Hypotheses 10 was developed to test the association between gender and loan sizes for Indonesian data.

H10: Gender (SEX) is associated with loan size (ILA)

The third determinant of loan size to be examined was borrower income. Although more accurate measurement of the income is desirable to estimate the borrower level of poverty, it is limited by the data availability (Quayes, 2015). Hypothesis 11 was developed to test the correlation between borrower income and loan sizes for Indonesian data.

H11: Borrower income (INC) is correlated with loan sizes (ILA)

As the objective of this study, all the hypotheses above are aimed to compare the relationship of depth of outreach and sustainability between individual and group lending. They can be recapitulated in Table 4.1 as follows:

Table 4.1 Summary of hypotheses

No	Hypotheses
H1	: Loan size (ILA) in individual lending is correlated with the interest rates (IRP).
H2	: Loan size (ILA) in group lending is correlated with the interest rates (IRP).
H3	: Gender (SEX) in individual lending is associated with interest rates (IRP).
H4	: Gender (SEX) in group lending is associated with interest rates (IRP).
H5	: Loan sizes (ILA) in individual lending are associated with the likelihood of loan collectability (COL).
H6	: Loan size (ILA) in group lending are associated with the likelihood of loan collectability (COL).
H7	: Gender (SEX) in individual lending is associated with the likelihood of loan collectability (COL)
H8	: Gender (SEX) in group lending is associated with the likelihood of loan collectability (COL)
H9	: Lending method (LME) is associated with loan size (ILA)
H10	: Gender (SEX) is associated with loan size (ILA)
H11	: Borrower income (INC) is correlated with loan sizes (ILA)

4.4.2 Defining a population

Population can be defined as “...an entire set of objects, observations, or scores that have some characteristics in common” (Wrench, Thomas-Maddox, Richmond, & McCroskey, 2013, p. 314). The results of a study are inferences of the defined population (Cooper & Schindler, 2014). In the present research, the population is defined as all borrowers of microfinance institutions in the Central Java province of Indonesia. All members of this population have two characteristics in common. The population comprises borrowers of specific financial institutions which offer microfinance. All of these borrowers are located in one province in Indonesia, Central Java.

The population size is unknown. The number of microfinance institutions that had registered with the Financial Service Authority of Indonesia prior July 2017 was 161 institutions. However, detailed data about the microfinance borrowers in the province is not available. In addition, there are large variations in the number of microfinance borrowers within each institution. It might be difficult to roughly estimate the total number of borrowers based on this number of institutions.

4.4.3 Sampling approaches

A sample is the fragment of population members that is actually included in the study (Wrench et al., 2013). One of the objectives of taking a sample is to estimate the parameters of a population such as mean, standard deviation, proportion, etc. These

parameters can be more accurately estimated if the sample is sufficiently representative. There are two options of sampling design: probability and non-probability (Wrench et al., 2013). The probability sampling design ensures equal chances of the population members being selected. Some options of this probability sampling including: 1) simple random; 2) stratified random; 3) cluster sampling; and 4) systematic random.

The second option for sampling design is nonprobability sampling. The sample is not randomly sampled which is still representative but may result in ungeneralizable results. Some possible reasons for choosing nonprobability sampling including difficulties to determine an appropriate population due to new field of study or the phenomenon, difficulties in obtaining a sample, costs and time constraints, and a limited population that has characteristics required for the study (Wrench et al. 2013). Some options of this nonprobability sampling methods including: 1) convenience sampling; 2) volunteer sampling; 3) purposive sampling; 4) quota/stratified sampling; and 5) network sampling.

In this study, non-probability sampling was selected for reasons of data availability, costs constraints and time constraints. Specifically, three sampling methods applied in this study are convenience, purposive and network sampling. All these methods were used in the selection of microfinance institutions. A list of microfinance institutions in Central Java province was provided by the office of Financial Service Authority (FSA). Purposive sampling method was also applied to produce a sample that can be logically assumed to be representative of both group and individual lending. The representation of both lending methods is important for the purpose of this study. The sampling method is appropriate to select "information-rich" cases to be explored (Patton, 2015). The sample must have knowledge and experiences in either individual or group lending. It helps to gain valuable information about the lending from interviews with the managers of the sample microfinance for the qualitative analysis. In addition, the sample can provide loans information of both individual and group lending for the quantitative analysis. The institutions are selected from both lending category by applying convenience sampling. The application of convenience sampling means that the selection of microfinance institutions was based on some factors. Location, time, the availability of the managers, and travel/accommodation costs are the other important factors when selecting the sample. The researcher contacted the institutions based on the list provided by the FSA. Some institutions were not contactable. To optimize the sample size, network sampling was applied. This sampling method is also known as snowball or multiplicity sampling (Lavrakas, 2008). Initial sample was chosen, and the sample was extended by using the network of microfinance institutions in the Central Java province. Participating respondents were requested to help finding other microfinance institutions as the

sample. For the loan data, there is no sampling procedure being applied. All the loan data was collected from the sample microfinance institutions that have been selected.

4.4.4 Sample size

To obtain a desirable estimate of population requires a sufficient number of samples to be used in the statistical analysis. Statistical methods used in this study (logistic regression and multiple regression) require a substantial “cases-to-IVs” ratio (Tabachnick & Fidell, 2013), in terms of the number of observations to the number of independent variables (IVs). If the ratio is less than 1, the IVs will exactly predict the outcome and the result will be meaningless. On the other hand, too many cases will make all relationships between IVs and dependent variables significant. There are four factors that must be considered in determining an appropriate sample size, including desired power, alpha level, number of predictors and expected effect sizes.

A simple rule of thumb to calculate sample size is using a formula $N \geq 50 + 8m$ (Green, 1991; Tabachnick & Fidell, 2013). N is the number of required samples and m is the number of independent variables (IVs). If the dependent variable is not normally distributed, a higher ratio of cases-to-IVs is required.

A sign of the small sample problems in multiple regression are high parameter estimates and high standard errors (Tabachnick & Fidell, 2013). Another indication is a large difference in R^2 and adjusted- R^2 . In case of logistic regression, this problem is more difficult to identify because the regression does not have an adjusted- R^2 .

This study has 20 independent variables. Using the rule of thumb formula above, the minimum number of cases or sample required will be 210 cases ($50 + 8 \cdot 20$). The sample of this study is 1,638 observations, which is more than the required minimum number of samples. Therefore, it is expected the problem of small sample size can be avoided for both ANCOVA multiple regression and logistic regression in this study.

4.4.5 Sampling criteria

Secondary data is as important as primary data and can be used as a main data source to answer the research questions (Ghuri, Grønhaug, & Kristianslund, 1995). The present study uses this data source from the sample microfinance institutions. It contains both borrower and loan information of microfinance institutions.

There were three criteria in selecting the sample institutions. First, the sample had to be an institution registered as microfinance institution by the Financial Service Authority of Indonesia. This criterion needs to be explicitly stated since micro lending is not

exclusively offered by the registered microfinance institutions. Several commercial banks including Bank Rakyat Indonesia (BRI) also provide small scale loans regulated with banking regulations, which are beyond the objectives of the present research. The second criterion is the lending product of the microfinance institution (individual and group lending). This is an important criterion, being the basis for the institution performance comparison. Some institutions offer only a specific type of lending product. Therefore, the sample had to be selected carefully to represent both lending methods. Third, Islamic (sharia) microfinance institutions were excluded in this study because the characteristics of such microfinance lending are different from conventional lending. The lending does not recognise interest rates and has distinct sharia types of lending products (such as *mudarabah*, *wadiah*, *musharaka*, *murabahah*, and *ijara*). These types of lending have different characteristics and features that are beyond the scope of this study.

The sampling process was only undertaken up to the selection of microfinance institutions. The sample were selected from microfinance institutions in Central Java province. Around 60% of MFIs were in this province. The rest of institutions were spread out in several different provinces including Jakarta, West Java, West Sumatera and East Java. Costs and time constraint are the main reason of the selection of only one province of Central Java as the study location. However, it has another advantage in terms of isolating the cultural and religious effects on the lending behaviour of the microfinance borrowers. Almost every province has a different and unique culture and/or religious beliefs. By focusing on the borrowers from only microfinance institutions in Central Java province, it helps reducing the effects of culture and religion on the relationship between depth of outreach, sustainability, and lending methodology without having to adding new variables of culture and/or religion and achieve more parsimony models.

Loan data was collected from the sample institutions without a further sampling process. A worksheet template was provided so that the institutions could easily input and send data to the researcher. Some institutions have not computerised their information database, thus the template was helpful.

4.4.6 Analysis methods

This analysis investigated lending sustainability and outreach as the main generating income activity of microfinance. The first sustainability measure was loan collectability. If lending can be maintained at a high repayment rate, it can be more sustainable. Quayes (2015) uses a loan loss reserve ratio (LLRR) to predict financial performance and sustainability of microfinance. The LLRR indicates a fraction of the loan portfolio to

anticipate default loans of microfinance. The study utilised panel data from the Microfinance Information Exchange (MIX) database over the period of 2003-2006 covering 764 microfinance institutions in Asia, Africa and other regions. Applying an ordinary least square regression method resulted in bias and inconsistent estimation because of violation of exogeneity and autocorrelation assumptions. Therefore, this study employed instrumental variables and two-stage least squares to obtain unbiased and consistent estimates. The study found that LLRR had a significant negative effect on all sustainability microfinance indicators, including profit margin rates, return on assets and operational self-sufficiency. Churchill and Marr (2017) found that default loans have significant negative impacts on sustainability of microfinance. In their research the default loan was calculated using the loan loss ratio (LLR). The study applied three methods of estimation (pooled OLS, fixed and random effects and mainly the generalised method of moments (GMM) regression) to investigate sustainability and outreach of microfinance institutions in Latin America and the Caribbean (LAC) and South Asia (SA). The GMM is preferred since it can solve endogeneity and reverse causality problems to provide robust estimates. The study analysed panel data of microfinance institutions from the MIX database over a period from 2005 to 2012. The analysis covered 215 institutions in SA countries and 332 institutions in LAC countries and found that LLR is inversely related to microfinance sustainability.

The second sustainability parameter is interest rates, which is the main income of microfinance. The lending is more sustainable if it can generate sufficient revenues to cover the credit risks and operating costs. Dorfleitner et al. (2013) examined the factors affecting interest rates of microcredit. Their study used panel data for the period of 2004-2011 from the Microfinance Information Exchange (MIX) database, complemented with country specific information from the World Bank database. A limitation of this study is that it could not obtain data on interest rates at borrower level so that the rates were replaced by a proxy rate using a lending rate formula. The data, comprising 3,087 observation from 712 institutions was analysed with panel regression methods, time fixed effects model and OLS estimator. This study found that operating costs are the key determinant of microcredit interest rates. It also found that gender and lending methods have a significant impact on microcredit interest rates. Women borrowers paid higher interest rates than men borrowers. Abrar (2019) utilised panel data regression to investigate the influences of microfinance social and financial performance on loan interest rates using unbalanced panel data for the period of 2006 to 2012 from the Microfinance Information Exchange (MIX) database. The data covers 382 institutions from 70 countries with 3,631 observations. Similar to the study of Dorfleitner et al. (2013),

this study did not use the actual interest rates of the loans. The interest was estimated from weighted average interest revenues of microfinance and was regressed with the parameters of social and financial performance of microfinance including average loan size, lending methodology, return on asset, number of borrowers, and other variables. By applying the random effects model and the generalised method of moments (GMM), the study found a negative relationship between loan size and interest rates. It also concluded that interest revenues are important for microfinance financial performance and sustainability.

There are various multivariate statistics techniques for analysing data with multiple independent variables and/or multiple dependent variables (Tabachnick & Fidell, 2013). Table 4.1 provides five options of multivariate analysis techniques and the required types of variable. Non-metric variables are measured either by binary, nominal or ordinal scale, whereas metric variables are measured either by interval, ratio or continuous scale. There are two options of analysis techniques using single and non-metric dependent variables (logistic regression and discriminant analysis). Both techniques use multiple but different measurement of independent variables. Logistic regression can use both metric and non-metric independent variables while discriminant can only use metric independent variables. On the other hand, multiple regression can be used if the dependent variable is a single metric variable. It can be regressed with multiple independent variables in a metric scale.

Two statistical techniques are available for multiple dependent variables, including Canonical analysis and Mancova analysis. Both techniques use multiple dependent and multiple independent variables. The difference is that the first option requires metric independent variables while the second requires non-metric independent variables. The present study will regress two dependents separately, hence these techniques are irrelevant.

Table 4.2 Multivariate statistics techniques

Techniques	Types of variable required
Logistic regression	Single non-metric dependent variable. Multiple metric and non-metric independent variables.
Discriminant analysis	Single non-metric dependent variable. Multiple metric independent variables.
Linear multiple regression	Single metric dependent variables. Multiple metric independent variables.
Canonical correlation	Multiple metric dependent variables. Multiple metric independent variables.
Mancova	Multiple metric dependent variables. Multiple non-metric independent variables.

Source: Hair, Anderson, Tatham, and Black (1998)

Quantitative analysis in the present research was approached by two techniques. First, linear multiple regression was used to test all hypotheses related to interest rates. It was estimated with the Ordinary Least Square (OLS) method. Literature indicates that OLS multiple regression analysis has been used on various microfinance studies such as to see how joint liability improves borrowers discipline (Mahmud, 2019), to examine the link between microfinance performance and corporate governance (Iqbal, et al. 2019), and to find the determinants of microfinance lending interest rates (Dorfleitner, et al. 2013). This regression method has various multiple statistical tests such as t-test, F-test, and model fits (Hair et al., 1998 and Gujarati, 2003). It also enables us to incorporate categorical variables in the regression model that is the case of the present study such as gender, lending methods and loan types (Gujarati, 2003). Lastly, this method fits with the type of dependent variable which is a single metric variable (Hair et al., 1998). The variable is the microfinance loans interest rate that is used as dependent variable. Second, logistic regression was used to test all hypotheses related to loan collectability. It was estimated with the Maximum Likelihood method. This regression has also frequently been used in microfinance studies such as to find the effects of gender on repayment (Alam, et al., 2019), to examine the link between lending method and loan performance (Jarungrattanapong, 2018), and to find determinants of default probability (Dorfleitner, et al., 2017). This regression also fits with the type of dependent variable used in this analysis (loan collectability) which is a binary dummy variable.

Table 4.3 summarises the hypotheses that have been developed in the methodology chapter. There are 11 hypotheses that will be tested in this chapter. Hypotheses 1 to 4 are about the relationship between depth of outreach and interest rates. Hypotheses 5 to 8 are about the relationship between depth of outreach and loan performance. The last three hypotheses are about the determinants of loan size.

Two regression models will be applied to test the hypotheses. There are three dependent variables with two types of data that will be regressed with two different regression methods accordingly. Interest rates (IRP) and loan size (ILA) are continuous variables. These variables are regressed with an Ordinary Least Square (OLS) linear multiple regression. Loan collectability (COL) is categorical data that will be regressed by a binary logistic regression.

Table 4.3 Hypotheses and the corresponding regression technique

No	Hypothesis	Regression Technique
Relationship between depth of outreach and interest rates		
H1	Loan size (ILA) in individual lending is correlated with interest rates (IRP)	OLS Linear multiple regression
H2	Loan size (ILA) in group lending is correlated with interest rates (IRP)	OLS Linear multiple regression
H3	Gender (SEX) in individual lending is associated with interest rates (IRP)	OLS Linear multiple regression
H4	Gender (SEX) in group lending is associated with interest rates (IRP)	OLS Linear multiple regression
Relationship between depth of outreach and loan performance		
H5	Loan size (ILA) in individual lending is associated with the likelihood of loan collectability (COL)	Binary logistic regression
H6	Loan size (ILA) in group lending is associated with the likelihood of loan collectability (COL)	Binary logistic regression
H7	Gender (SEX) in individual lending is associated with the likelihood of loan collectability (COL)	Binary logistic regression
H8	Gender (SEX) in group lending is associated with the likelihood of loan collectability (COL)	Binary logistic regression
Loan sizes determinants		
H9	Lending method (LME) is associated with loan size (ILA)	OLS Linear multiple regression
H10	Gender (SEX) is associated with loan size (ILA)	OLS Linear multiple regression
H11	Borrower income (INC) is correlated with loan size (ILA)	OLS Linear multiple regression

4.4.6.1 Logistic Regression

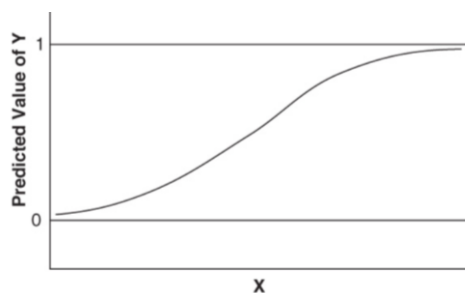
Logistic regression is used to “...predict a discrete outcome such as group membership from a set of variables that may be continuous, discrete, dichotomous or a mix” (Tabachnick & Fidell, 2013). Basically it combines two different sets of statistical techniques, cross-tabulation and ordinary least square (OLS) multiple regression (Menard, 2010, p. 1). Cross-tabulation is good at handling categorical non-metric variables while OLS generally requires metric variables. Blending these two techniques

enables us to predict a categorical outcome with a set of metric and non-metric independent variables.

Logistic regression requires dependent variables in non-metric scales including binomial, ordered multi-categories, or un-ordered multi-categories scales. Nonetheless, this regression allows independent variables in both metric and/or non-metric scale. Logistic regression violates “measurement assumption” in a multiple regression OLS (Menard, 2010, p. 10). OLS assumes that the dependent variable is a continuous data with ratio or interval measurement. The dependent variable in a logistic regression is a discrete data measured by either binomial or ordinal. This violation causes some consequences, including:

1. It needs different way of interpreting the regression’s predicted values, coefficients and intercept. Predicted values are construed as the predicted probability that a case falls into whichever is the highest probability between the two categories of the dependent variable. This value can only take a value between 0 and 1 (see Figure 4.3).
2. The variability of residuals are correlated with the independent variables (heteroscedastic of residual variances), which results in an unbiased but not a best estimate.
3. Residuals will not be normally distributed
4. Invalid confidence interval and hypothesis testing for the regression coefficients.

Figure 4.3 Logistic curve model for a binomial dependent variable



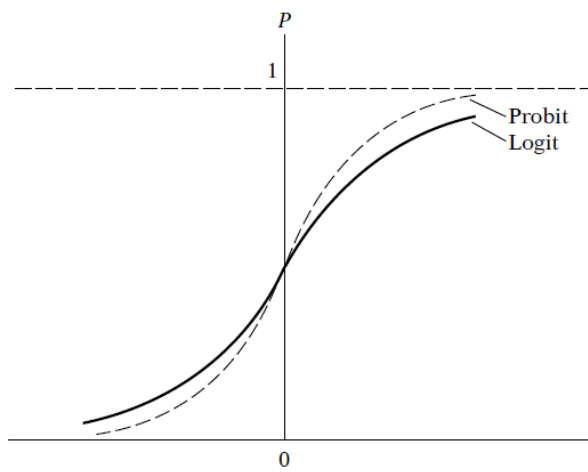
Source: Menard (2010, p. 16)

Gujarati (2003, p. 582) explains three different approaches to regression with a binary dependent variable. The first approach is a Linear Probability Model (LPM). This model is similar to a standard linear regression except for the dichotomous dependent variable. Nonetheless, applying an OLS estimator on this model will raise four issues. First, the residuals of this model will not be normally distributed as it will take binomial distribution as the dependent variable. Second, this model violates the assumption on homoscedastic variances of residuals resulting in unbiased but not efficient estimates.

Third, the fulfilment of fundamental restriction of probability $0 \leq E(Y_i | X) \leq 1$ cannot be guaranteed. Last, the value of conventional measure of goodness of fit (R^2) will be likely much less than 1. Thus R^2 may not be appropriate to be used to measure goodness of fit in binomial response regression using LPM.

Logit and probit models are two alternative approaches to LPM. These models provide similar results (Brooks, 2008; Gujarati, 2003). It is suggested that "...there is no compelling reason to choose one over the other" (Gujarati, 2003, p. 614). The major dissimilarity is the shape of cumulative probability function where logit is flatter than probit as shown in Figure 4.4. Both models will be described in this section.

Figure 4.4 Cumulative Probability Function of Probit and Logit



Source: Gujarati (2003, p. 614)

First, the description of basic logit model. For example, Y is a dependent variable that takes the value of 1 if a loan is default and 0 if a loan is performing. The probability of loan is default:

$$P_i = E(Y = 1 | X_i) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}} \quad (\text{Eq. 4.1})$$

Or it can be simplified as:

$$P_i = \frac{1}{1 + e^{-Z_i}} = \frac{e^Z}{1 + e^Z} \quad (\text{Eq. 4.2})$$

$$1 - P_i = \frac{1}{1 + e^Z} \quad (\text{Eq. 4.3})$$

Where:

P_i is a dependent variable of probability $Y=1$ given a set of independent variables X_i

$$\text{and } Z_i = \beta_1 + \beta_2 X_i$$

Equation 4.2 is a **cumulative logistic function** where Z_i varies between $-\infty$ and $+\infty$ and P_i varies between 0 and 1. If the probability of a loan to be default is P_i then, the probability of the loan to be performing will be $1-P_i$. In this example, the **odds ratio** is a ratio of probability default loan to probability the loan is performing ($P_i / (1-P_i)$). Taking the log of this ratio results in the following logit model:

$$L_i = \ln \left[\frac{P_i}{1-P_i} \right] = Z_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \mu_i \text{ (Eq. 4.4)}$$

There are several features of this model (Gujarati, 2003, p. 596):

1. L_i ranges between $-\infty$ and $+\infty$
2. P_i varies between 0 and 1
3. L_i is linear in both X_i and the parameters.
4. P_i is not linear in X_i
5. It can have multiple X_i in this model
6. It needs to take the anti-log of the predicted value of L_i to obtain the value of P_i

To estimate the intercept and the coefficient(s), it needs to distinguish the types of data used in this analysis. There are two types of data: 1) data at the individual or micro level; 2) data in a group or from a replication. The second type may not be relevant in the present research since analysis is using data at the individual level. The estimation method for the logit model using data at the individual level cannot utilise OLS. A feasible alternative is the maximum likelihood (ML) method. The objective of this method "...is, to obtain the values of the unknown parameters in such a manner that the probability of observing the given Y's is as high (maximum) as possible." (Gujarati, 2003, p. 634)

On the other hand, the probit model uses a cumulative normal distribution function instead of cumulative logistic distribution as used in the logit model (Brooks, 2008). The function of cumulative normal distribution is as follows:

$$F_{z_i} = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{z_i}{\sigma}\right)^2} \text{ (Eq. 4.5)}$$

Where:

$$z_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \mu_i$$

Like the logit model, the estimation of the probit model cannot use OLS because of non-linearity of the model. Maximum likelihood (ML) is the most common method used for

the probit model (Brooks, 2008; Gujarati, 2003; Hair et al., 1998). The coefficients in Eq. 4.4 and Eq. 4.5 need to be transformed into probability percentages. For example, The coefficient β_2 should be multiplied by $F(X_{2i})$ in the probit model or by $P(X_{2i})$ in the logit model to obtain the association between changes in one unit of X_{2i} and the probability.

The logit/probit models have been applied in microfinance studies for examples to examine lending performance and credit constraints. Sarwosri, Römer, and Musshoff (2016) analysed the causes of constrained access to credits of female farmers in Madagascar, Africa. The study utilised a large dataset consisting of 9,710 loans disbursed in 2007 to 2012 by a commercial microfinance institution. It was questioned if female farmers are more credit constrained than male farmers. Since the dependent variable is a dummy variable that takes 1 if the loan is disbursed female and 0 otherwise, this study utilised a logit model. The result indicates that the probability of women farmers obtaining the loan is twice the probability of men but they have lower repayment performance.

Dorfleitner et al. (2017) analysed the factors influencing the probability of default (PD) of microcredits in Nicaragua. The analysis used panel data for the period of 2001 to 2012 from a non-profit rural microfinance institution. The PD is a binary dummy variable that takes 1 if the loan is default and 0 otherwise. Taking into account the data structure, a logistic crossed random-effect regression was selected along with a Markov Chain Monte Carlo (MCMC) method of estimation. The study found that income or wealth of the borrowers reduced significantly the PD, whereas gender had no significant impact on the PD.

Hering and Musshoff (2017) examines the effects of payment delays in previous loans on the current loans repayment performance of one microfinance institution in Azerbaijan. This analysis utilised a large data set consisting of 355,036 business loans from the years 2007 to 2012. The loan repayment performance is represented by probability of default (PD) which has two categories, late payments and defaults. The logit model was applied in the analysis for the reason that although both probit and logit are suitable for a binomial dummy dependent variable, the latter does not require normal distribution of residuals. The main finding is that the PD is positively and significantly affected by delays in previous loans. It was also found that male borrowers have higher PD than female borrowers. An interaction variable of farmer (dummy) and previous loan delays does not influence PD significantly.

Diaz-Serrano and Sackey (2018) investigates the extent to which the types of microfinance institutions affect the credit rationing to sample borrowers of 14 institutions

in Ghana. The sample comprises 1,429 observations from both fully and partially granted loans. The study selected the probit model instead of logit for the analysis method. This method is more ideal for hypothesis testing because of the normal distribution assumption of its residuals. The investigation found that there is no significant association between types of institution and credit rationing. Nevertheless, credit rationing is lesser in the government-supported microfinance institutions.

The probit model will be applied to examine the effect of outreach on default probability of microfinance loans. Default probability is represented by a variable called collectability which takes a value of 1 if default loan and 0 if performing loan. This dependent variable is a transformation of the original categorical data to simplify the interpretation of the output of this analysis. Originally, there were three level categories, default, doubtful and performing. The first two categories were regrouped into a category, non-performing loan, while keeping the third category as it is.

The probit model for loan collectability is formulated as follows:

$$\ln \left[\frac{P_i}{1-P_i} \right] = COL_i = \beta_1 + \beta_2 ILA_{2i} + \beta_3 SEX_{3i} + \beta_4 LEM_{4i} + \beta_5 SCR_{5i} + \beta_6 \mathbf{b}_{6i} + \beta_7 \mathbf{l}_{7i} + \mu_i \quad (\text{Eq. 4.6})$$

Where P_i indicates probability of a loan being defaulted and $1 - P_i$ is the probability of a loan being performing. The variable COL_i is a dependent dummy variable that represents loan performance or collectability where it takes the value of 1 if the loan is default and otherwise 0. The intercept is denoted by β_1 . Two variables of outreach are represented by ILA and SEX , with the coefficients of β_2 and β_3 respectively. The other main variable in this model is lending method, which is indicated by LEM with the coefficient of β_4 and the scope of relationship (SCR) with the coefficient of β_5 . The vector of variables of borrower characteristics including occupation (OCC) and education (EDU) is indicated by \mathbf{b} . Loan characteristic variables including type of loan (LTY), loan tenure (TEN), type instalment ($INST$) and collateral (CLL) are represented by a vector of \mathbf{l} .

4.4.6.2 Multiple Regression

The use of multiple regression analysis is to predict how the dependent variable changes as a results of changes in independent variables (Hair et al., 1998). In contrast to simple regression where there is only one independent variable, multiple regression examines the link between a single dependent variable and multiple independent variables (Gujarati, 2003; Maddala, 2001). In general, the population and sample multiple regression functions can be formulated respectively as follows

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_k X_{ki} + \mu_i \quad (\text{Eq. 4.7})$$

$$\hat{Y}_i = \hat{\beta}_1 + \hat{\beta}_2 X_{2i} + \hat{\beta}_3 X_{3i} + \dots + \hat{\beta}_k X_{ki} + \hat{\mu}_i \quad (\text{Eq. 4.8})$$

Where \hat{Y}_i is the conditional mean or estimated value of Y_i . The coefficient $\hat{\beta}_k$ is the estimator of β_k . The difference between Y_i and the estimated value is the stochastic disturbance or error term ($\mu_i = Y_i - \hat{Y}_i$). Ordinary least squares (OLS) method can be used to estimate the value of coefficients $\hat{\beta}_k$ (Gujarati, 2003). The application of this method requires the fulfilment of the underlying assumptions.

1. Linearity of parameters in the regression linear as shown in (Eq. 4.7)
2. Non-stochastic independent variables
3. Zero expected value of disturbance ($E(\mu_i | Y_i) = 0$)
4. Homoscedasticity of disturbance
5. No conditional autocorrelation of disturbance
6. Covariance between disturbance and independent variable is zero
7. The number of observations must be greater than the number of independent variable(s)
8. Variability of independent variable(s)
9. No bias or error in the specification of regression function
10. No perfect multicollinearity of independent variables.

To estimate the value of coefficients $\hat{\beta}_k$, the OLS method uses the criterion of minimum sum of squared residuals. It can be written mathematically as $\sum \hat{\mu}_i^2 = \sum (Y_i - \hat{Y}_i)^2$. OLS will find the combination of coefficients $\hat{\beta}_k$ that minimises the sum squared of residuals. A coefficient of determination R^2 is used to measure how good the estimated regression fits the data. It can be computed by dividing the sum of squared differences between predicted and expected value of Y_i with the sum squared differences between actual and expected value of Y_i (see equation (3.5.9) below).

$$R^2 = \frac{\sum (Y_i - \bar{Y}_i)^2}{\sum (Y_i - \hat{Y}_i)^2} \quad (\text{Eq. 4.9})$$

Where \hat{Y}_i is the predicted value of Y_i . The \bar{Y}_i is the expected value or the mean value of Y_i . This coefficient of determination falls between 0 and 1 ($0 \leq R^2 \leq 1$) where the closer the coefficient to 1, the better the data fits the estimated regression line.

The multiple regression can contain not only quantitative/metric but also qualitative/non-metric variables (Gujarati, 2003). This type of regression that incorporates both

qualitative and quantitative variables is an analysis of covariance (ANCOVA) model. The quantitative variables are called covariates. The introduction of a dummy qualitative variable into a multiple regression can take two forms, additive or interactive. The additive form will shift the intercept of the regression line, whereas the interactive form will change the regression slope. The interactive form is done by multiplying the dummy variable with the covariate.

Linear multiple regression has been applied in studies on microfinance. Oke, Adeyemo, and Agbonlahor (2007) studied the determinants of repayment of microcredits Southwestern Nigeria. A survey was conducted with 200 microfinance borrowers. The repayment performance is measured by a proportion of the loan repaid when it is due. This performance is regressed with independent variables including income, gender, loan amount, education, distance between banks and borrower dwelling, number of businesses, and others. The study applied linear multiple regression with the OLS estimation method and found that several factors including penalty on late repayment, income of borrower, delayed loan disbursement, spending on socio-cultural activities, and membership in cooperative societies significantly influence the repayment performance.

Bakker, Schaveling, and Nijhof (2014) investigates the impacts of corporate governance on sustainability and outreach performances of microfinance institutions in developing countries. The data for this analysis was taken from a Dutch investment manager. It consists of 97 microfinance institutions from 35 countries in six world regions. This study applies hierarchical multiple regression on the sustainability indicator (return on asset, operating self-sufficiency and financial self-sufficiency) and outreach indicators (number of active borrowers, average loan balance, percentage of women borrowers and proportion of rural loans). The study found that sustainability and proportion of female borrowers are significantly affected by insiders. Being regulated microfinance affects on sustainability.

Nanayakkara (2017) investigates the determinants of microfinance institutions' performance in reducing poverty in a sustainable operation. The performance is represented and calculated with four dimensions including increase in outreach, sustainability, depth of outreach and portfolio at risk. This analysis utilises a dataset obtained from the MIX database comprising 235 microfinance institutions from 63 countries. Two multiple regression models were employed for this analysis. The first model does not include interaction variables (age X gender, age X profitability and literacy X gender) but includes variables of organisation types (NGO, bank, cooperative

and non-bank). These organisation types variables are excluded in the second model. This study found that gender, literacy rate, MFI age, orientation on profit, operational efficiency and no diversification affects positively and significantly the microfinance performance. However, the size and types of microfinance do not significantly influence the performance.

Regarding the applicability of linear multiple regression in a quantitative dependent variable, the ANCOVA model will be used for the second sustainability indicator of loan interest rates. It will be the dependent variable in the ANCOVA model and be regressed by outreach indicators which are represented by two independent variables, gender and an initial loan amount.

4.4.6.3 Statistics Software

The statistical analysis as explained in the previous sections utilised the statistical package version 21. This software provides various tools that are needed for the purposes of analysis, including descriptive statistics, cross tabulation, graphical description, ANOVA, ANCOVA, and the logit model. The maximum likelihood method required for logistic regression as needed in equation (3.5.6) is available in this software, as well as the standard OLS method required for the ANCOVA model estimation.

4.5 The qualitative analysis

The face-to-face interviews sought to explore lending methodology of microfinance institutions. Interview is "...conversation with a purpose" (Berg, 2017, p. 65). Specifically, it is defined as "...a method of data collection that involves two or more people exchanging information through a series of questions and answers" (Blackstone, 2019, p. 108). Ability to ask follow-up questions is one advantage of using this method over a survey. It is useful for a highly complex research topic that requires back-and-forth dialogue between the interviewer and interviewee.

Interviews in qualitative research are conducted with open-ended questions, in contrast to close-ended questions in quantitative research (Blackstone, 2019, p. 108). The interviewer follows an interview guide that outlines the key issues, topics or questions. There is no specific format for the interview guide because it relies on "...your style, experience, and comfort level as an interviewer or with your topic" (Blackstone, 2019, p. 110).

In terms of structure, there are three types of interview questions, including structured, semi-structured and unstructured (Esterberg, 2002; Merriam & Tisdell, 2016; Yin, 2016).

Structured interviews are a survey conducted with oral questions and are usually scripted. They use predetermined, close-ended and orderly worded questions. Semi-structured interviews use flexible inquiries without predetermined wording. The questions are open-ended and the interaction is in conversational mode. Unstructured interviews use open-ended questions and commonly are aimed at formulating questions for next stage interviews. Semi-structured interviews are commonly used for qualitative social research (Bryman, 2006).

In the present study, the semi-structured style was chosen for the interviews with microfinance managers. This allowed me to obtain insightful information from the managers and to provide any clarification if necessary about the questions being asked.

4.5.1 Number of respondents (sample size)

Although there may be no specific answer for how many to include in the sample size for a qualitative research study (Creswell, 2014), the interview needs a "...continuing, fruitful relationships with respondents and through theoretical contemplation to address the research problem in depth" (Crouch & McKenzie, 2006, p. 483). Therefore, it is suggested that a maximum sample of 20 may be sufficient to have close relationships and in depth conversation with the respondents. Alternatively, Creswell (2014) suggests that the sample size depends on the types of qualitative research adopted by the researcher. Saturation in themes or categories can also be used as criteria for determining the sample size. If there seems to be no additional new information uncovered from the interview, it may be an indication of an optimal sample size.

I set the number of participants for the interviews the same as the number of microfinance institutions visited. This decision was due to the reason that the interviews were being conducted to get information from the perspective of lenders about sustainability, outreach and the lending methods. Therefore, the manager of each microfinance institutions was interviewed during the field trip. The interviews were conducted by myself instead of having someone else get involved in this important process.

4.5.2 Interview questions

The questions for the semi-structured interviews of this study were developed from the literature reviews and were focused on information about the loans and the lending process as well as the loan performance (see Appendix 4.1). The interviews were expected to discover various lending methods of microfinance to be able to sustain their operation and serve the financial needs of poor borrowers and small businesses.

Yin (2016) provides hints to carrying out a successful interview. First, the interviewer should speak “much” less than the interviewee, a monologue dialogue, to obtain as much information as possible. Probes and follow-up inquiries can provide more detailed information from the respondents. Second, the interview should not be directive. The interviewer lets the respondents express their own way of thinking. Third, body language and gestures of the interviewer should be kept in a neutral condition so as not to affect the subsequent response to a question. Fourth, the interviewer should maintain good interpersonal practices during the interview process. Inappropriate word choice that may be offensive to the respondent needs to be avoided. Fifth, it is also suggested to use an interview guide to help the interviewer. This functions as a reminder and should not be used as a questionnaire. Last, the interviewer needs to be constantly analysing an ongoing interview to determine when to shift the topic, when to asking follow-up questions, and when is the right time to move from the original interview guide.

4.5.3 Validity and reliability of interview questions

In the context of qualitative research, validity of research findings is determined by employing appropriate procedures to assess the findings’ accuracy while reliability refers to consistency in applying the research approach across various studies (Creswell, 2014). The validity is seen from the standpoint of the respondent, the audience and the researcher itself (Creswell & Miller, 2000). Creswell (2014) recommends eight strategies to improve the validity of qualitative research: 1) triangulate information from various sources, aiming at achieving converged information; 2) ask the respondent to comment on and review the analysis and findings; 3) provide complete and rich information in explaining the findings, including the interview setting; 4) explain any researcher bias to have an open and honest narration; 5) present all information both supporting or contradicting a theme; 6) spend longer time with the respondent to gain in-depth understanding of a phenomena in the setting; 7) utilise peer debriefing to review the study to improve the accuracy and validity of findings; and 8) use someone (external auditor) who is unfamiliar with the corresponded research or the researcher to review all aspects of the research.

Gibbs (2007) (as cited in Creswell, 2014) suggests the following procedures to increase the reliability of a qualitative research approach: 1) checking for transcription errors; 2) making sure that the definition of codes does not shift during the process of coding; 3) if the coding process is conducted by a team, make sure the communication between the team members is effective; 4) crosscheck the coding results among different members of the team.

4.5.4 Analysis methods

Qualitative analysis is aimed “...to reach some inferences, lessons, or conclusions by condensing large amounts of data into relatively smaller, more manageable bits of understandable information” (Blackstone, 2019, p. 112). The data provides details about people, actions and social events (Neuman, 2014). The analysis is trying to look for patterns and links in the details and then to discover general themes or trends. The process of analysis starts with transcribing the interviews (Blackstone, 2019). It involves transforming each word said in the recorded interviews into a written document as well as mentioning the person speaking. Although hiring someone to do the transcribing is acceptable, Blackstone (2019) suggests that the researcher do the process by him or herself.

The next step is to read carefully the transcripts and identify the code to make sense of qualitative data. The coding requires repetitive reading of the transcripts to have a clear idea of the themes and to decide which appropriate codes to use (Blackstone, 2019). As opposed to assigning numbers to cases as in quantitative research, the coding in qualitative research aims at detecting related phenomena, collecting relevant instances or cases of the phenomena, and finding their similarities and differences (Esterberg, 2002). A code is a label or tag that is use to assign particular “units of meaning” to information (Neuman, 2014). It will be attached to a piece of either word(s), phrase(s), sentence(s), or paragraph(s). There are two types of coding, open and focused coding (Blackstone, 2019; Esterberg, 2002). The first is an “open mind” coding, in which the way the transcript is coded is not affected by the research questions or the researcher’s expectation. The second coding process is to narrow down categories that have been identified in the open coding stage. It involves merging or collapsing related codes. This process is then followed by naming and defining the final codes to make meaning and help the researcher explaining the results.

In the present study, the analysis process was carried out soon after interviews were conducted. It was started by a transcribing process. The interviews were transcribed by a professional to accelerate the analysis stage. In addition, some respondents spoke in their own language (Javanese) during the interview. Therefore a professional transcriber who understood the language would provide better results. Although it was transcribed by another, the transcripts were reviewed by the researcher to ensure the accuracy by comparing the text and the recording.

Once all the interviews have been transcribed, the next step is to encode the text. Generally the encoding process will follow Strauss (1987) (as cited in Neuman, 2014),

who suggested three types of data coding process. First, an open coding process was performed to compress the data into manageable information in codes or categories. This first stage coding generated initial codes or categories. The second step was a process of making connections between codes or categories that had been generated in the initial stage. This process is called axial coding, which looked for several aspects of lending practices of the microfinance institutions. Last, selective coding involved identifying and selecting key categories of microfinance lending activities to construct a story around those main activities.

Specifically, the present research followed combination approach that combined priori and inductive approaches as outlined by Miles and Huberman (1994, p. 61). A priori approach is a coding generating method that starts creating a “provisional start list” of codes from various sources such as research questions, research problems and/or the conceptual framework. The inductive approach is the opposite of the priori approach, in which the codes are produced along with analysing the interview transcripts. Meanwhile, the present research started with a list of codes and then updated the list with an inductive process.

4.6 Research ethics

The Universal Declaration of Human Right 1948 recognises that every human being has inalienable rights to be respected and protected. In the context of research, the investigator must respect the participant’s right: 1) not to be injured or mistreated; 2) to be informed and consent to take part in the research; and 3) to be treated with privacy, confidentiality and/or anonymity (Curtis & Drennan, 2013). Therefore, the present study needed to comply with the requirements of the National Health and Medical Research Council (NHMRC) “National Statement on Ethical Conduct in Human Research (2007)” by the Victoria University Human Research Ethics Committee.

The research ethics approval by the Victoria University Human Research Ethics Committee requires an online application via <https://quest.vu.edu.au/rmenet/>. The ethics application (No: HRE18-032) was submitted electronically on 21st February 2018. The application was finalised and approved on 6th April 2018. There were eight documents attached in the online application forms (Table 4.4).

Table 4.4 Research ethics documents

No	Description	Reference (file name)
1	Consent Form	VUHREC Application Consent Form combined.docx
2	Information to Participants Involved in Research	Information to Respondent v2.docx
3	Declaration Form for External Investigators	External investigator form Dicky.pdf
4	Consent Form translated	VUHREC Application Consent Form combined Translated.pdf
5	Focus group discussion schedule	FGD schedule v1.docx
6	Information to Participants revised	Information to Respondent v3.docx
7	Information to Participants revised and translated	Information to Respondent v3 translated.pdf
8	Interview schedule	Interview schedule v1.docx

Potential risks associated with the research were assessed and it was concluded that: 1) there were no risks (physical risk, psychological risk and social risk) for participation in the research beyond the normal experience of everyday life, in either the short or long term; 2) there were no risks involving the researchers; 3) there were not any risks to individuals who are not part of the research, such as a participants' family member(s) or the social community; and 4) there were no legal issues or legal risks associated with any aspect of the research that required specific consideration (i.e., are significant or out of the ordinary)

The participants were initially approached via telephone to explain about the research. They formally notified the investigators of their interest in participating in this research by signing a consent form (see Appendix 4.2). The ethics documents were given to the participants when conducting the interview, as well as the Information to Participant (ITP) form (Appendix 4.3) and verbal explanation of the information.

Data was coded and de-identified to protect the confidentiality and privacy of the participants and the microfinance institutions. All data, including consent forms, loans data and audio recordings of interviews, was scanned and stored to a hard disk immediately. The hard copies were kept by the student investigator. This was to secure access to confidential data and records, including consent forms, collected during the research.

4.7 Summary

The chapter has covered methodology and specific methods adopted in the present study. This study is overarched by pragmatic research world view. It combines quantitative and qualitative examination to create a more in-depth understanding of the

relationship between outreach and sustainability of microfinance in the research setting of Central Java Province, Indonesia.

Quantitative data is complemented with the qualitative data from interviews with microfinance managers to enrich and deepen the analysis. Two different data collection methods were selected, including secondary data collection as a method, and the qualitative analysis used interviews as a method. The secondary data provides information about loans and the borrowers, which is needed for the quantitative analysis. The qualitative analysis makes use of data from interviews with the microfinance institution managers.

The quantitative analysis strategy to investigate the relationship between sustainability and outreach uses linear multiple regression and logistic regression. Data types of the dependent variables dictate types of regression to be used. Interest rates are regressed by using linear multiple regression. Loan performance is regressed with a logistic binary regression.

The qualitative analysis applies thematic analysis by condensing the interview data into codes. The interviews were transcribed before the coding process begun. This was done by a professional transcriber in Indonesia who understands the local language. There were three steps in the coding process, including open coding, axial coding and selective coding. This process made the large amount of information manageable for making meaning of the data.

CHAPTER 5 DESCRIPTIVE STATISTICS ON MICROFINANCE INSTITUTIONS LENDING

This chapter describes the data statistics collected through the survey of microfinance institutions. Descriptive statistics serve “to simply summarize and describe the data we’ve collected” (Weiers, Gray, & Peters, 2011, p. 5). On the other hand, inferential statistics draw conclusions from populations based on samples of data obtained, that is, inferences. Descriptive statistics help to understand the data and to obtain a higher quality of analysis and interpretation (Hair, Black, Babin, & Anderson, 2014). These statistics commonly measure central tendency, variability and distribution of the data (Creswell, 2009).

An overview of the data is presented systematically. It shows characteristics of borrowers in terms of gender, age, education, income, and occupation. This chapter also presents information related to loans in terms of loan amount, interest rates, instalment in arrears, collectability, lending method, type of instalment, collateral, tenure, loan type, and lending relationship. Statistical software, IBM SPSS Software, was used to do this analysis.

5.1 Quantitative data collection

A total of 20 microfinance institutions were visited during a fieldtrip in the province of Central Java, Indonesia. Fourteen microfinance institutions provided data about the borrowers and 6 institutions were unable to provide data due to reasons such as the unavailability of data or loss of contact. The data from one MFI was removed since there are too many missing data in 7 of 14 variables. The result of the initial compilation was that out of 13 institutions, data was obtained for 2,238 borrowers, as shown in Table 5.1.

The Table 5.1 shows descriptive statistics of 16 variables. The variables consist of three continuous variables (ILA, INTEREST RATES, and INC), three binomial variables (GENDER, LENDING METHOD, and RELATIONSHIP SCOPE), and the other ten categorical variables. Two variables (AGE and INC) have 134 and 1,407 missing data items, respectively. Initial loan amount (ILA) and gender are two variables representing microfinance outreach. Interest rates and collectability are two variables representing microfinance lending sustainability. Details of each categorical variable and of the other variables are explained in the following five sections. Section 5.2 describes demography of borrowers including gender, occupation, education and age. Section 5.3 discusses statistics of two parameters of outreach and two parameters of sustainability of the

sample microfinance. It also describes the relationship between the sustainability and the outreach. Section 5.4 outlines the microfinance lending methods and their association with both the sustainability and the outreach. Section 5.5 discusses the scope of lending relationship and how it links to the sustainability and outreach. Section 5.6 describes loan characteristics, including the collateral, tenure, and the types of loan instalment.

Table 5.1 Data Description

	N	Minimum	Maximum	Mean	Std. Deviation
ILA in USD	2238	10.86	7240.61	414.45	609.94
GENDER	2238	0	1	0.38	0.49
INTEREST RATES (%)	2238	0.50	3.50	1.99	0.58
COLLECTABILITY	2238	1	3	2.90	0.38
LENDING METHOD	2238	0	1	0.12	0.33
EDUCATION	2238	1	5	3.14	1.19
OCCUPATION	2238	1	10	6.10	2.31
AGE	2104	19	79	45.75	11.05
INSTALMENT TYPES	2238	3	6	4.37	1.49
COLLATERAL	2238	1	11	1.85	0.85
TENURE (MONTHS)	2238	1	72	13.90	8.92
LOAN TYPE	2238	1	3	1.70	0.46
RELATIONSHIP LENGTH	2238	1	20.0	4.26	4.22
RELATIONSHIP SCOPE	2238	0	1	0.72	0.45
INC in USD	831	7.24	4344.36	323.91	517.28
Valid N (listwise)	697				

5.2 Demography characteristics of borrowers

Table 5.2 shows the distribution of borrowers based on gender and occupation. The largest proportion (41.4%) of the borrowers are in the farming sector. More than 77% of these farmers are male. The next largest proportion of borrowers are in trades, the private sector and the government/military/police sector, with proportions of 14.8%, 14.1% and 10.0% respectively. Male borrowers have a greater proportion than female in those three sectors.

Table 5.2 Gender and occupation of borrowers

OCCUPATION		GENDER		Total
		Male	Female	
Unemployed	Count	0	8	8
	% by OCCUPATION	0.0%	100.0%	100.0%
	% by GENDER	0.0%	0.9%	0.4%
	% of Total	0.0%	0.4%	0.4%
Housewife	Count	0	135	135
	% by OCCUPATION	0.0%	100.0%	100.0%
	% by GENDER	0.0%	15.9%	6.0%
	% of Total	0.0%	6.0%	6.0%
Civil servant / military / police	Count	135	88	223
	% by OCCUPATION	60.5%	39.5%	100.0%
	% by GENDER	9.7%	10.4%	10.0%
	% of Total	6.0%	3.9%	10.0%
Private employees	Count	189	126	315
	% by OCCUPATION	60.0%	40.0%	100.0%
	% by GENDER	13.6%	14.9%	14.1%
	% of Total	8.4%	5.6%	14.1%
Traders	Count	127	204	331
	% by OCCUPATION	38.4%	61.6%	100.0%
	% by GENDER	9.1%	24.1%	14.8%
	% of Total	5.7%	9.1%	14.8%
Labour	Count	114	42	156
	% by OCCUPATION	73.1%	26.9%	100.0%
	% by GENDER	8.2%	5.0%	7.0%
	% of Total	5.1%	1.9%	7.0%
Farmer	Count	715	212	927
	% by OCCUPATION	77.1%	22.9%	100.0%
	% by GENDER	51.4%	25.0%	41.4%
	% of Total	31.9%	9.5%	41.4%
Fishermen	Count	1	0	1
	% by OCCUPATION	100.0%	0.0%	100.0%
	% by GENDER	0.1%	0.0%	0.0%
	% of Total	0.0%	0.0%	0.0%
Others	Count	109	33	142
	% by OCCUPATION	76.8%	23.2%	100.0%
	% by GENDER	7.8%	3.9%	6.3%
	% of Total	4.9%	1.5%	6.3%
Total	Count	1390	848	2238
	% by OCCUPATION	62.1%	37.9%	100.0%
	% by GENDER	100.0%	100.0%	100.0%
	% of Total	62.1%	37.9%	100.0%

Table 5.3 shows the proportion of borrowers based on gender and education. It shows that most borrowers, either female or male (42.5%), attained primary education. Generally, the proportion of female education attainment is lower than male, especially in lower-middle income countries (Heath & Jayachandran, 2016). However, Table 5.3 shows the proportion of females and males at every education level are nearly the same, except for borrowers with tertiary education, where females have a higher proportion than male (26.4% and 16.5% respectively).

Table 5.3 Gender and education of borrowers

EDUCATION		GENDER		Total
		Male	Female	
NA	Count	2	10	12
	% by EDUCATION	16.7%	83.3%	100.0%
	% by GENDER	0.1%	1.2%	0.5%
Elementary school	% of Total	0.1%	0.4%	0.5%
	Count	592	360	952
	% by EDUCATION	62.2%	37.8%	100.0%
Junior high school	% by GENDER	42.6%	42.5%	42.5%
	% of Total	26.5%	16.1%	42.5%
	Count	293	138	431
Senior high school	% by EDUCATION	68.0%	32.0%	100.0%
	% by GENDER	21.1%	16.3%	19.3%
	% of Total	13.1%	6.2%	19.3%
Tertiary education	Count	274	117	391
	% by EDUCATION	70.1%	29.9%	100.0%
	% by GENDER	19.7%	13.8%	17.5%
Total	% of Total	12.2%	5.2%	17.5%
	Count	229	223	452
	% by EDUCATION	50.7%	49.3%	100.0%
Total	% by GENDER	16.5%	26.3%	20.2%
	% of Total	10.2%	10.0%	20.2%
	Count	1390	848	2238
Total	% by EDUCATION	62.1%	37.9%	100.0%
	% by GENDER	100.0%	100.0%	100.0%
	% of Total	62.1%	37.9%	100.0%

Table 5.4 shows the age distribution of microfinance borrowers based on gender. There are 134 missing units of data of the age variable; thus the table only shows the distribution of 2,104 observations. The majority of borrowers' ages range between 41-60 years old, for 56.4% or 1,186 borrowers. Within this age category, 62.6% are male borrowers and 37.4% are female borrowers. The second largest age group is 21-40 years old. There are 706 borrowers who fall into this category and 52.7% of them are male. Almost in all age categories the male borrowers have a larger proportion than female borrowers, except in the category of 20 years or below where 66.7% are female.

Table 5.4 Gender and age of borrowers

Age Category		GENDER		Total
		Male	Female	
<= 20 y.o.	Count	3	6	9
	% within Age Category	33.3%	66.7%	100.0%
	% within GENDER	0.2%	0.7%	0.4%
	% of Total	0.1%	0.3%	0.4%
21 y.o. - 40 y.o.	Count	372	334	706
	% within Age Category	52.7%	47.3%	100.0%
	% within GENDER	29.3%	40.1%	33.6%
	% of Total	17.7%	15.9%	33.6%
41 y.o. - 60 y.o.	Count	742	444	1186
	% within Age Category	62.6%	37.4%	100.0%
	% within GENDER	58.4%	53.3%	56.4%
	% of Total	35.3%	21.1%	56.4%
61 y.o. - 80 y.o.	Count	154	49	203
	% within Age Category	75.9%	24.1%	100.0%
	% within GENDER	12.1%	5.9%	9.6%
	% of Total	7.3%	2.3%	9.6%
Total	Count	1271	833	2104
	% within Age Category	60.4%	39.6%	100.0%
	% within GENDER	100.0%	100.0%	100.0%
	% of Total	60.4%	39.6%	100.0%

5.3 Lending outreach and sustainability

This study uses two indicators of both outreach and sustainability of microfinance. The outreach indicators are sex and initial loan amount. Proportion of female borrowers is widely used as a measure of microfinance outreach (Blanco-Oliver, Irimia-Diequez, & Reguera-Alvarado, 2016; Churchill, 2017; Gutierrez-Goiria, San-Jose, & Retolaza, 2017; Xu et al., 2016) since it is arguable that women are more vulnerable than men (Bhatt & Tang, 2001; Churchill & Marr, 2017). Initial loan amount is also often used as a measure of outreach (Blanco-Oliver et al., 2016; Bos & Millone, 2015; Gutierrez-Goiria et al., 2017; Sheremenko et al., 2017; Xu et al., 2016). Smaller loan amount is often associated with lower borrower income and thus deeper outreach. On the other hand, the sustainability parameters used are interest rates and loan collectability. It is arguable that the lending activity of microfinance can be more sustainable if it generates sufficient revenues from interest and it has a low delinquent loan rate. The following descriptive presentation will emphasise these indicators.

5.3.1 Outreach and sustainability indicators

There is a total of 848 female and 1,390 male borrowers from the 13 microfinance institutions (Table 5.5). There are three MFIs (MFI B, MFI P and MFI S) that serve more female than male borrowers. MFI S has the largest number of female clients, which is 2.7 times the number of males. There is no MFI that provides loans entirely to women.

Table 5.5 Borrowers distribution by MFI and gender

NAME OF MFI		GENDER		Total
		Male	Female	
	MFI A	47	15	62
	MFI B	29	48	77
	MFI D	55	44	99
	MFI E	105	7	112
	MFI F	33	19	52
	MFI G	90	10	100
	MFI H	67	18	85
	MFI I	376	120	496
	MFI K	14	8	22
	MFI O	121	52	173
	MFI P	176	184	360
	MFI Q	166	22	188
	MFI S	111	301	412
Total	13	1390	848	2238

The monthly average interest rate of MFI loans is 1.99% with a minimum of 0.5% and a maximum of 3.5%. MFIs with smaller numbers of borrowers tend to charge a single interest rate to all borrowers, as shown in Table 5.6. An MFI that has less than 150 borrowers charges a single interest rate to all borrowers. Most loans have interest rates between 2% and 2.5%. There is only one MFI that charges 0.5% per month.

Table 5.6 loan interest rates

Interest rates	MFI A	MFI B	MFI D	MFI E	MFI F	MFI G	MFI H	MFI I	MFI K	MFI O	MFI P	MFI Q	MFI S	Total
0.50	-	-	-	-	-	-	-	10	-	-	-	-	-	10
1.00	-	77	-	-	-	-	-	2	-	1	6	-	-	86
1.20	-	-	-	-	-	-	-	-	-	-	6	-	-	6
1.25	-	-	-	112	-	-	-	-	-	-	128	-	-	240
1.30	-	-	-	-	-	-	-	-	-	3	-	-	-	3
1.50	62	-	99	-	52	-	-	1	22	17	172	-	-	425
1.70	-	-	-	-	-	-	-	-	-	7	-	-	-	7
1.75	-	-	-	-	-	-	-	-	-	29	-	-	-	29
1.80	-	-	-	-	-	-	-	-	-	5	43	-	-	48
2.00	-	-	-	-	-	100	85	3	-	109	5	188	113	603
2.50	-	-	-	-	-	-	-	389	-	2	-	-	223	614
3.00	-	-	-	-	-	-	-	91	-	-	-	-	16	107
3.50	-	-	-	-	-	-	-	-	-	-	-	-	60	60
	62	77	99	112	52	100	85	496	22	173	360	188	412	2238

Table 5.7 shows loan collectability by MFI. Most loans are performing with less than 30 days' arrears. In total, there are only 15.8% loans that are either doubtful or in default. MFI A has the lowest proportion of performing loans. Three MFIs (G, H and K) have 100% performing loans.

Table 5.7 Loan collectability

		Collectability			Total
		default	doubtful	performing	
MFI A	Count	36	14	12	62
	% by NAME OF MFI	58.1%	22.6%	19.4%	100.0%
MFI B	Count	21	7	49	77
	% by NAME OF MFI	27.3%	9.1%	63.6%	100.0%
MFI D	Count	28	16	55	99
	% by NAME OF MFI	28.3%	16.2%	55.6%	100.0%
MFI E	Count	1	0	111	112
	% by NAME OF MFI	0.9%	0.0%	99.1%	100.0%
MFI F	Count	2	0	50	52
	% by NAME OF MFI	3.8%	0.0%	96.2%	100.0%
MFI G	Count	0	0	100	100
	% by NAME OF MFI	0.0%	0.0%	100.0%	100.0%
MFI H	Count	0	0	85	85
	% by NAME OF MFI	0.0%	0.0%	100.0%	100.0%
MFI I	Count	103	57	336	496
	% by NAME OF MFI	20.8%	11.5%	67.7%	100.0%
MFI K	Count	0	0	22	22
	% by NAME OF MFI	0.0%	0.0%	100.0%	100.0%
MFI O	Count	0	22	151	173
	% by NAME OF MFI	0.0%	12.7%	87.3%	100.0%
MFI P	Count	8	8	344	360
	% by NAME OF MFI	2.2%	2.2%	95.6%	100.0%
MFI Q	Count	6	0	182	188
	% by NAME OF MFI	3.2%	0.0%	96.8%	100.0%
MFI S	Count	14	10	388	412
	% by NAME OF MFI	3.4%	2.4%	94.2%	100.0%
Total	Count	219	134	1885	2238
	% by NAME OF MFI	9.8%	6.0%	84.2%	100.0%

Figure 5.1 below depicts the frequency distribution of loans based on the initial loan amount in USD. The graph class interval is USD300. It is shown that 1,492 loans are less than USD300. The average loan is USD414.45 with the smallest of USD10.86 to the largest of USD7,240.61.

Figure 5.1 Histogram of initial loan amount (ILA) in USD

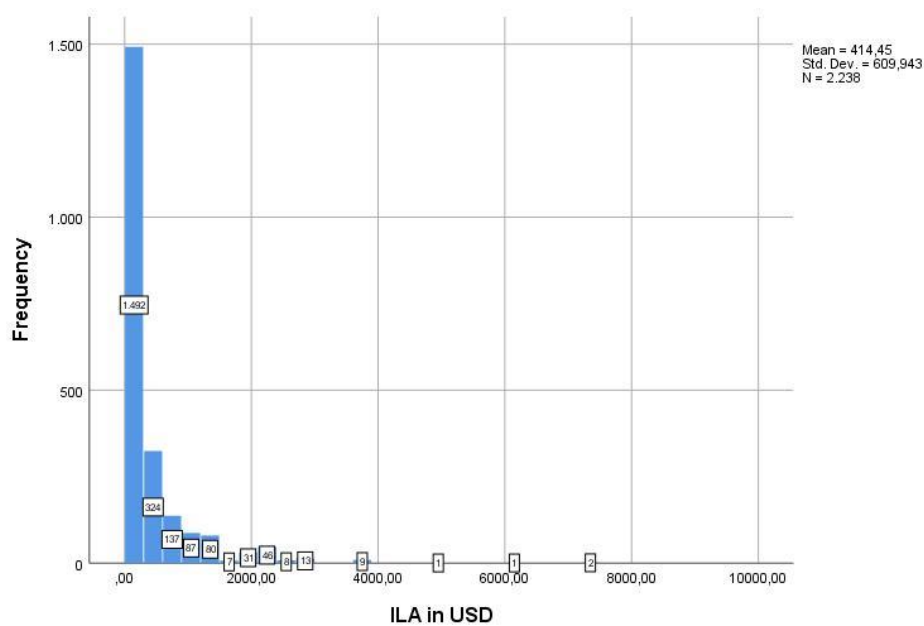
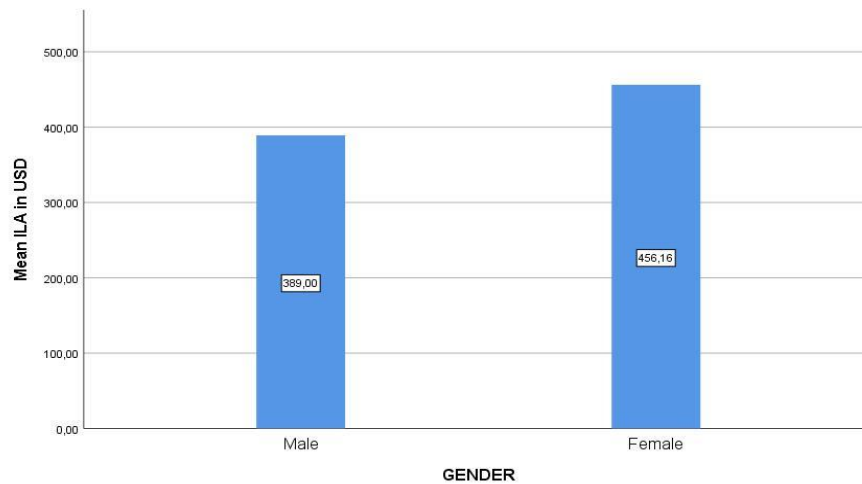


Figure 5.2 shows a comparison of average loan amount between female and male. There is an apparent difference between the means of the two groups. Female borrowers demanded larger loans than male borrowers. On average, each client received a loan around USD389 for male borrowers and USD456 for female borrowers. The standard deviation is USD524 for male borrowers and USD727 for female borrowers. This difference may be partly explained by the education level and occupation of female borrowers. Almost 40% of female borrowers are traders and employees in private companies (see Table 5.2). Whereas 51% of male borrowers are working in the farming sector, which might be considered riskier than the previous two occupations. In addition, 26% of female borrowers have a tertiary education while only 16% of male borrowers have the same level of education (see Table 5.3).

Figure 5.2 The mean of initial loan amount and borrowers' gender



5.3.2 Lending outreach and loans collectability

Figure 5.3 shows the mean of initial loan amount based on the category of loan collectability. Interestingly, the graphic reveals that loans in the default and doubtful categories tend to have a smaller average size than loans that are in the performing category. Average size for performing loans, doubtful and default loans are USD441, USD322 and USD239 respectively. The statistics show that larger loans tend to have a better repayment rate than smaller loans.

Figure 5.3 The mean of Initial Loan Amount for loan collectability

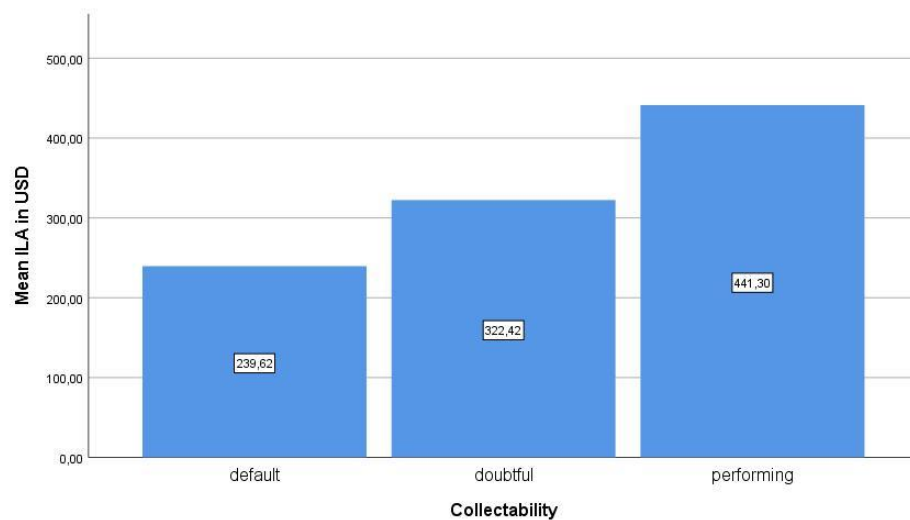


Table 5.8 shows loan collectability based on gender. There are gender differences in proportion of default and performing loans. The proportion of default loans for males is 5.2% higher than females. Whereas, the proportion of performing loans for females is 4.7% higher than males. There is only 0.5% difference in doubtful loans between males and females. It seems that women perform better than men in loan repayment.

Table 5.8 Loan collectability and borrowers' gender

Collectability		GENDER		Total
		Male	Female	
default	Count	158	61	219
	% by GENDER	11.4%	7.2%	9.8%
doubtful	Count	86	48	134
	% by GENDER	6.2%	5.7%	6.0%
performing	Count	1146	739	1885
	% by GENDER	82.4%	87.1%	84.2%
Total	Count	1390	848	2238
	% by GENDER	100.0%	100.0%	100.0%

5.3.3 Interest rates and outreach

Figure 5.4 displays differences in loan interest rates between males and females. The difference between the groups is small. The average interest rates of loans for male and female borrowers are 1.98% and 2.01% respectively. This statistics does not seem to confirm the finding of Dorfleitner et al. (2013), who concluded that lending rates for female borrowers were higher than male borrowers after controlling for the effects of specific factors of the institution and country. That study used panel data from 2004 to 2011 obtained from the Microfinance Information Exchange (MIX) database. It was a cross countries analysis that covered 54 countries with 712 microfinance institutions and 3,087 observation.

Figure 5.4 The mean interest rates and gender

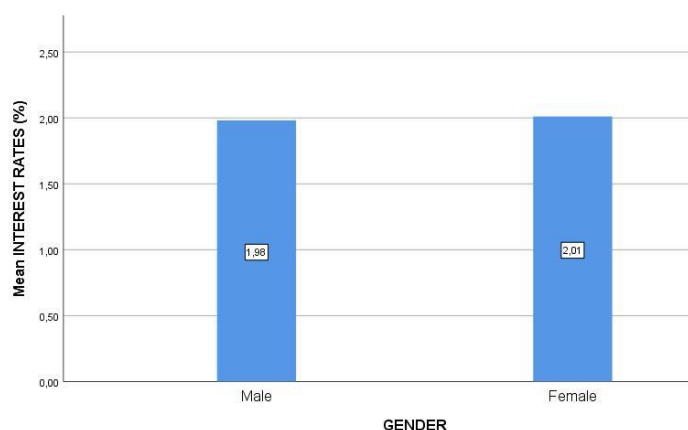


Figure 5.5 is a scatterplot displaying the relationship between interest rates and initial loan amount in USD with a fit line. Graphically, it seems that there is no apparent pattern of relationship of those two variables. However, an interpolation line indicates a negative relationship between interest rates and the initial loan amount. A higher interest rate is associated with a smaller initial loan amount. If the figures are compared as shown in

Table 5.9, a more obvious pattern of relationship between interest rates and initial loan amount appears. The table compares the mean and range of initial loan amount (USD) based on the lending interest rates. It seems that lower interest rates have association with a higher average of initial loan amount. All the average initial loan amounts for loans with interest rates less than 2% are larger than USD550 except for 86 loans with 1% interest having a low average loan amount (USD298.04).

Figure 5.5 Interest rates and loan amount

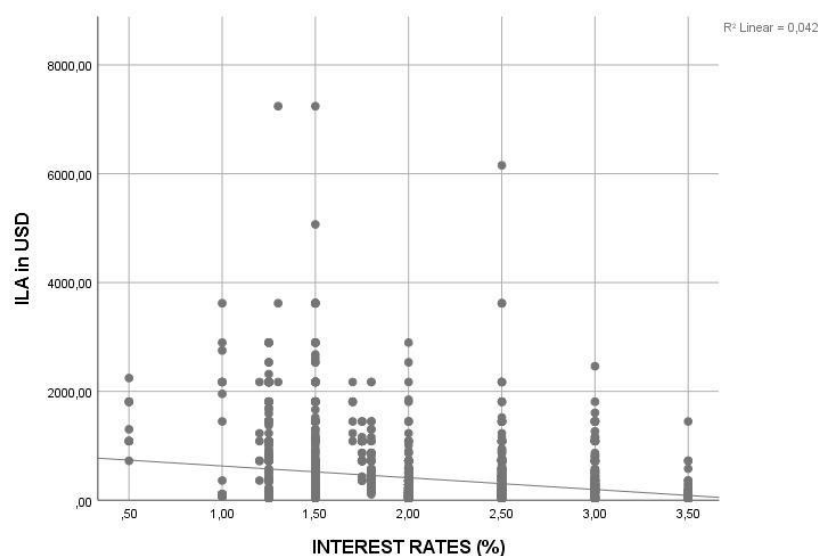


Table 5.9 Mean comparison of initial loan amount based on interest rates

INTEREST RATES (%)	Mean	Minimum	Maximum	N
0.50	1404.68	724.06	2244.59	10
1.00	298.04	72.41	3620.30	86
1.20	1049.89	362.03	2172.18	6
1.25	762.04	28.96	2896.24	240
1.30	4344.36	2172.18	7240.61	3
1.50	556.75	36.20	7240.61	425
1.70	1623.96	1086.09	2172.18	7
1.75	913.81	362.03	1448.12	29
1.80	646.37	108.61	2172.18	48
2.00	203.81	10.86	2896.24	603
2.50	320.84	14.48	6154.51	614
3.00	482.41	21.72	2461.81	107
3.50	143.48	14.48	1448.12	60
Total	414.45	10.86	7240.61	2238

5.4 Lending method

This section describes the data on two different lending methods of microfinance: group and individual lending. This study argues that lending method can affect the relationship between sustainability and outreach of microfinance because information gaps between

borrowers and lenders can be reduced by using group lending. For this reason, in this section descriptive statistics from the lending method will be displayed in relation to sustainability and outreach.

Table 5.10 shows the proportion of borrowers based on lending methods and gender. The majority of borrowers, both female and male (84.5% and 91.8% respectively), made loans with individual contracts. There are only 273 borrowers with group contracts and 79.1% of these are male. These group loans are from four MFIs. Overall, individual lending of both female and male borrowers dominates microfinance loans.

Table 5.10 Lending method by gender

Lending method		GENDER		Total
		Male	Female	
Individual lending	Count	1174	791	1965
	% by LENDING METHOD	59.7%	40.3%	100.0%
	% by GENDER	84.5%	91.8%	87.8%
Group lending	Count	216	57	273
	% by LENDING METHOD	79.1%	20.9%	100.0%
	% by GENDER	15.5%	6.7%	12.2%
Total	Count	1390	848	2238
	% by LENDING METHOD	62.1%	37.9%	100.0%
	% by GENDER	100.0%	100.0%	100.0%

Table 5.11 shows a comparison of initial loan amounts (in USD) based on the lending method. There is considerable difference in loan size between individual and group loans. On average, borrowers with individual lending enjoy a bigger loan size (USD457.29), but also with wider variation. Assuming initial loan size reflects the income of the borrower can reveal important information about the outreach of microfinance. Group lending has better outreach than individual lending because it provides loans to lower income clients. Group lending borrowers obtained smaller loan sizes on average (USD106.06), which is less than half size individual borrowers received. There are 26 groups of 4 MFIs. The number of members for each group varies, with a minimum of 2 people and a maximum of 35 people. The total group of borrowers is 273 people.

Table 5.11 Lending method and initial loan amount

LENDING METHOD	Mean	Minimum	Maximum	N
Individual lending	457.29	14.48	7240.61	1965
Group lending	106.06	10.86	868.87	273
Total	414.45	10.86	7240.61	2238

Table 5.12 shows the proportion of individual and group loans based on the collectability. The percentage of performing loans is 84.2% of total MFIs' loans. The percentage of performing loans of group lending is higher than individual lending. On the other hand, percentage of default and doubtful loans are higher in individual lending. Overall, group lending out performs individual lending.

Previous studies about lending method and repayment performance have not been conclusive. Some studies found that there is no strong evidence of improvement in repayment from group lending. Although the group lending increases the possibility of loan approval, Ladman and Afcha (1990) found no improvement in repayment of joint liability lending based on data from micro credits in Bolivia. Lending incentive may influence the loan performance. Vigenina and Kritikos (2004) found no significant difference between group lending and individual lending in Georgian microfinance. Both loans applied similar lending incentives but different lending terms. Jarungrattanapong (2018) conducted a field experiment in Thailand with 256 villagers. The study found joint liability lending equipped with dynamic incentive was not associated with higher repayment. The repayment was associated with group lending with joint liability but without dynamic incentive.

Meanwhile, other studies found significant evidence of the relationship between the lending method and repayment performance. An experiment by Abbink, Irlenbusch, and Renner (2006) with university students in Germany found that group lending repayment rates are higher than individual lending. Cason et al. (2012) carried out an experiment in two universities in Australia and one university in India. The study found that when group monitoring costs are lower than lender monitoring costs, group repayment rates are better than individual lending repayment rates. The repayment rates are the same when there are no differences in monitoring costs. Kodongo and Kendi (2013) compared the performance of individual and group lending of microfinance institutions in Kenya. The proportion of default loans in group lending was smaller than for individual lending. The study found evidence that group lending could perform better than individual lending in terms of repayment. Arnold, Reeder, and Steger (2013) argue that group lending has higher repayment rates and lower interest rates.

Table 5.12 Lending method and collectability

Collectability		LENDING METHOD		Total
		Individual lending	Group lending	
default	Count	205	14	219
	% by LENDING METHOD	10.4%	5.1%	9.8%
doubtful	Count	118	16	134
	% by LENDING METHOD	6.0%	5.9%	6.0%
performing	Count	1642	243	1885
	% by LENDING METHOD	83.6%	89.0%	84.2%
Total	Count	1965	273	2238
	% by LENDING METHOD	100.0%	100.0%	100.0%

Table 5.13 shows the interest rates by type of lending method. The average interest on individual loans and group loans are 1.9955% and 1.9762% respectively. It seems that there is no significant interest rate difference from the two types of lending methods. However, the interest rates of individual loans vary more widely than group loans. The lowest interest rate is 1.5% in individual loans and 0.5% in group loans. The highest interest rate is 3.5% in individual loans and 2.5% in group loans. On average, individual loans will give higher interest revenue for MFIs than group loans.

Table 5.13 Lending method and interest rates

LENDING METHOD	Mean	Minimum	Maximum
Individual lending	1.99	0.50	3.50
Group lending	1.98	1.50	2.50
Total	1.99	0.50	3.50

5.5 Scope of relationship

In addition to lending method, scope of relationship can play an important role in mitigating information asymmetries between borrower and lender (Boot, 2000). The lender could obtain soft information about the borrower from other products that the lender sells to the borrower. For example, an MFI could also accept deposits from the borrower, in addition to the loan. This section will describe statistically the scope of relationship and its links with the measures of sustainability and outreach.

Table 5.14 suggests that saving is more common in individual lending. There are 74.8% of individual borrowers that have a savings account in the associated MFI. In contrast, there are only 54% group borrowers that have savings accounts in the associated MFI. The savings are related to the legal form of the MFIs. The majority of the MFIs are

financial cooperatives. In the current Indonesia cooperative regulation, the borrowers are required to pay principal and mandatory savings when they became a member of a non-MFI cooperative. On the other hand, borrowers of an MFI cooperative are not obliged to pay principal or mandatory savings according to the Indonesian microfinance regulation. Although the savings are not mandatory for the borrowers of MFI cooperative, they frequently keep being collected by the MFI, which uses them as loan guarantees for individual lending to substitute asset collaterals. Meanwhile, most of group lending borrowers are the members of farmer-group in the village where the MFI is located. The farmer-groups collect monthly contribution from the members. This fund is commonly used as guarantee for the group loans. Therefore, the MFI does not always require the payment of principal and mandatory savings for group loans.

Table 5.14 Scope of relationship and lending methods

RELATIONSHIP SCOPE		LENDING METHOD		Total
		Individual lending	Group lending	
Without savings account	Count	496	123	619
	% by LENDING METHOD	25.2%	45.1%	27.7%
With savings account	Count	1469	150	1619
	% by LENDING METHOD	74.8%	54.9%	72.3%
Total	Count	1965	273	2238
	% by LENDING METHOD	100.0%	100.0%	100.0%

Borrowers who have microfinance savings accounts have a larger average loan size than borrowers who do not have a savings account (Table 5.15). The average initial loan amounts of borrowers who have savings and no savings accounts are USD445.08 and USD334.33 respectively. If initial loan amount is a robust proxy of income, it can be concluded that borrowers who save money in their respective microfinance institutions have a higher income.

Table 5.15 Scope of relationship and initial loan amount

RELATIONSHIP SCOPE	Mean	Minimum	Maximum
Without savings account	334.33	10.86	7240.61
With savings account	445.08	14.48	6154.51
Total	414.45	10.86	7240.61

Table 5.16 shows the collectability of loans from two categories of borrowers, with and without savings accounts. Overall, loan performance of borrowers with savings account is better than those who do not have a savings account. The proportion of default (15.0%) and doubtful (9.5%) loans is higher for borrowers without a savings account. In contrast,

the proportion of performing loans is higher for borrowers with a savings account (87.6%).

Table 5.16 Scope of relationship and loan collectability

Collectability		RELATIONSHIP SCOPE		Total
		Without saving account	With saving account	
default	Count	93	126	219
	% within RELATIONSHIP SCOPE	15.0%	7.8%	9.8%
doubtful	Count	59	75	134
	% within RELATIONSHIP SCOPE	9.5%	4.6%	6.0%
performing	Count	467	1418	1885
	% within RELATIONSHIP SCOPE	75.4%	87.6%	84.2%
Total	Count	619	1619	2238
	% within RELATIONSHIP SCOPE	100.0%	100.0%	100.0%

The average interest rates for borrowers who do not have a savings account in microfinance is lower than the average interest rate for customers who have savings accounts (Table 5.17). The average loan interest rate for borrowers with and without saving accounts respectively are 2.0535% and 1.8354%. The variation of loan interest rates without savings accounts is slightly narrower than the loan interest rates with savings accounts. This result is not expected because lenders theoretically can obtain important private soft information from borrowers when they buy other financial services from the lenders which reduce the borrower risks (Chakraborty & Hu, 2006). A possible explanation for this fact is that the MFI needs bigger revenue to cover the cost of capital from the depositor. Although most depositors do not receive monthly interest income from the deposit, the MFI must share its annual profit to both the depositor and the debtor. According to Cooperative Law number 17 of 2012, financial profit / loss of a cooperative in Indonesia is called SHU (*"sisa hasil usaha"*) or "the remaining results of operations" which is the difference between the income of the cooperative in one year after deduction of operating expenses. Cooperative members are both owners and users of cooperative services. Members have the right to obtain the share of SHU and the remaining assets from the settlement of the cooperative. Members' Meeting has the authority to determine the distribution of the SHU. Referring to the provisions of the articles of cooperative association and the decisions of the members' meeting, the SHU is set aside first for the retained earnings and the remainder is used wholly or partly for

several uses including: a) distribution to members in proportion to business transactions carried out by each member with Cooperative; b) distribution to members in proportion to their Cooperative Capital Certificate; c) bonus payments to cooperative supervisors, administrators, and employees; d) payment of obligations to cooperative development funds and other obligations; and / or e) other uses stipulated in the Articles of Association.

Table 5.17 Scope of relationship and interest rates

RELATIONSHIP SCOPE	Mean	Minimum	Maximum
Without savings account	1.84	1.00	3.50
With savings account	2.05	0.50	3.50
Total	1.99	0.50	3.50

5.6 Other loan characteristics

Table 5.18 shows the use of collateral on group and individual loans. Collateral is not only required in individual lending but also group lending. More than 60% of individual loans require either asset collateral or another type of collateral. There are 35.7% individuals that did not pledge collateral. On the other side, 96% of group loans require no collateral.

Table 5.18 Lending methods and collateral

COLLATERAL		LENDING METHOD		Total
		Individual lending	Group lending	
Without collateral	Count	701	262	963
	% by LENDING METHOD	35.7%	96.0%	43.0%
Asset collateral	Count	656	11	667
	% by LENDING METHOD	33.4%	4.0%	29.8%
Other collateral	Count	608	0	608
	% by LENDING METHOD	30.9%	0.0%	27.2%
Total	Count	1965	273	2238
	% by LENDING METHOD	100.0%	100.0%	100.0%

Table 5.19 shows the loan duration of the sample of borrowers in microfinance. The minimum loan tenure is one month while the maximum loan tenure is 72 months. The average loan has a tenure of around 14 months. On average, the loan tenure for individual lending is longer than group lending. The longest tenure for individual loan is 72 months, while the longest tenure for group lending is 24 months. Most individual loans are between 4 to 36 months whereas most of group loans are 12 months. The shortest tenure for individual and group loans are 1 and 6 months respectively.

Table 5.19 Loan tenure by lending method (in months)

	N	Minimum	Maximum	Mean
Individual Lending	1965	1	72	14,23
Group lending	273	6	24	11,56
Total	2238	1	72	13.90

Table 5.20 compares the instalment types of individual lending and group lending. There are two types of repayment installations of microfinance lending in the sample borrowers: monthly and seasonally. There are 60.1% of individual loans using monthly instalments, while the other 39.9% use seasonal instalments. In contrast, more than 86% of group loans use seasonal instalments.

Table 5.20 Instalment types and lending methods

INSTALMENT TYPES		LENDING METHOD		Total
		Individual lending	Group lending	
Monthly	Count	1181	36	1217
	% by LENDING METHOD	60.1%	13.2%	54.4%
Seasonally	Count	784	237	1021
	% by LENDING METHOD	39.9%	86.8%	45.6%
Total	Count	1965	273	2238
	% by LENDING METHOD	100.0%	100.0%	100.0%

Figure 5.6 shows distribution of borrowers based on type of loan instalment and occupation. The highest number of borrowers with monthly instalments is from borrowers who work in the private sector, while seasonal instalments are dominated by borrowers from the farming sector. Farmers incline to seasonal instalments because this matches the production cycle of their crops.

Figure 5.6 Distribution of borrowers based on instalment types and occupation

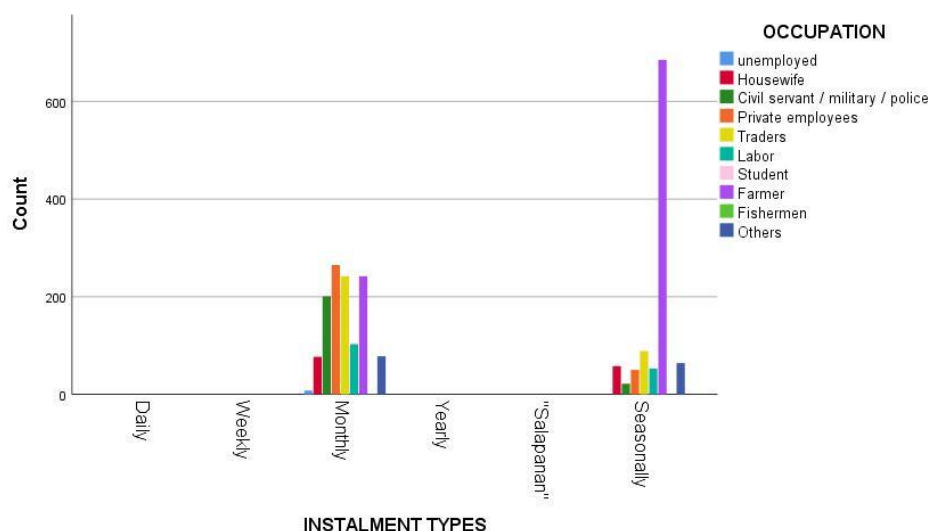


Table 5.21 show borrowers' occupation and types of loan instalment by lending methods. Most borrowers in both group and individual lending are farmers, 709 and 218 respectively. Majority of individual loans have monthly repayment while majority of group loans have seasonal repayment. For individual lending, private employees are majority loans with monthly repayment (261 borrowers) while farmers dominate individual loans with seasonal repayment (479 borrowers). On the other hand, both monthly and seasonal repayment loans are dominated by farmers, 12 and 206 respectively.

Table 5.21 Instalment types and occupation by lending methods

OCCUPATION	INSTALMENT TYPES					
	Individual lending			Group lending		
	Monthly	Seasonally	Total	Monthly	Seasonally	Total
unemployed	2	0	2	6	0	6
Housewife	76	52	128	1	6	7
Civil servant / military / police	201	18	219	0	4	4
Private employees	261	47	308	4	3	7
Traders	237	84	321	5	5	10
Labor	97	45	142	6	8	14
Farmer	230	479	709	12	206	218
Fishermen	1	0	1			
Others	76	59	135	2	5	7
Total	1181	784	1965	36	237	273

5.7 Conclusions

This chapter provides descriptive statistics on outreach and sustainability of microfinance lending from the sample microfinance borrowers. The present study uses two indicators of lending outreach (gender and initial loan amount) and two indicators of lending sustainability (interest rates and loan collectability). From the total 20 microfinance offices approached during the fieldtrip, 14 microfinance institutions provided loan data while the other 6 microfinance institutions declined.

Proportion of women is an indicator of social performance of microfinance. The proportion of women in the sample borrowers is 37.9% which indicates lower participation of women in microfinance lending. The highest proportion by sector, of about 25% female borrowers, worked in the farming sector. More than 50% of the female borrowers are aged between 41 to 60 years old. Interestingly, while in some developing countries women are left behind in education compared to men, the sample borrowers of Indonesian microfinance show the proportion of females attaining tertiary education (26.3%) is higher than the proportion of males with the same level of education (16.5%).

The second indicator of social performance is loan size. It is the proxy of the income of borrowers. Lower loan size indicates better social microfinance performance. More than 60% of the loans are USD300 or smaller. The microfinance provided loans of, on average, USD414.45 per borrower. There are a few borrowers who received a loan above USD1,000. On average, females received larger loans than for males. The education attainment and occupation may explain these differences.

Interest rates is a parameter of lending sustainability. MFI lending can be more sustainable if it can earn sufficient interest income. Overall, the average loan interest rate is 1.99% per month with a minimum of 0.5% and maximum of 3.5% per month. Smaller MFIs tend to charge single interest rate to all borrowers. It was also found that women pay lower interest rates than men. This is contrary to the finding of Dorfleitner et al. (2013) who found evidence that lending rates of female borrowers were higher than male. The data also gives an indication of a negative relationship between the interest rates and the average of the initial loan amount. Smaller loan size may give higher interest revenues to MFI.

The second parameter of lending sustainability is the loan performance. Overall, more than 84% of MFI loans are performing. There is one MFI with poor lending performance with only 19.4% performing loans. Eight of 13 MFIs have a proportion of performing loans greater than 90%. The data shows that smaller loans tend to associate with default and

doubtful loans. Larger loans have a better repayment rate. It was also found that women perform better than men in loan repayment.

An important characteristic of microfinance is lending method. Most of the sample of microfinance loans (87.8%) are individual lending. This method dominates microfinance lending for both women and men borrowers. There is a large difference in loan size between the group and individual lending methods. Average loan size in individual lending is at least four times higher than the loan size of group lending. It could be an indication of higher social performance of group lending over individual lending. In terms of loan performance, group lending outperforms individual lending. The default rate of individual loans (10.4%) is higher than group loans (5.1%). However, the average interest rate of group and individual loans is nearly the same.

Overall, 43% of sample loans do not use collateral. Collateralised loans are still dominating microfinance lending. However, the incidence of loan collateral mostly occurs in individual lending. More than 60% of individual loans required collateral whereas only 4% of group loans required collateral. This simply shows that the group method is well suited to lending for poorer borrowers.

Another characteristic of microfinance lending is type of loan instalment. There are two types of instalment, monthly and seasonally. In total, the proportion of monthly (54.4%) and seasonal (45.6%) loans are nearly equal. However, an obvious difference was found between group and individual loans. There are more than 86% of group loans using seasonal instalment, while more than 60% of individual loans are using monthly instalment. The borrowers of seasonal loans are dominated by farmers. This repayment schedule can match the production cycle of crops. On the other hand, most borrowers of monthly loans are employees of government or private companies.

Some borrowers have deposits in the corresponding MFI. About 72% of sample borrowers have deposits. The proportion of borrowers with and without a savings account is relatively equal in group lending, 54% and 45% respectively. The proportion is considerably different in individual lending where 75% of individual borrowers have a savings account in the corresponding MFI. Borrowers without a savings account have poorer loan performance than those with a savings account. It was also found that loan size of borrowers who do not save money in the microfinance institution is smaller than those who have savings. A savings account may associate with higher income borrowers.

CHAPTER 6 QUALITATIVE ANALYSIS ON THE EXISTING LENDING OF MICROFINANCE INSTITUTIONS IN CENTRAL JAVA PROVINCE OF INDONESIA

6.1 Introduction

The objective of this chapter is to understand the existing lending methodology of the studied microfinance institutions by exploring the lending practices of both group and individual loans. The exploration uses a qualitative study approach, adopting semi-structured interviews. A sample of 20 managers from 20 different MFIs who are involved in day to day operations of microfinance lending were selected with a convenience sampling method. To obtain an optimum variation sample, all MFIs in the study area were grouped into three categories based on the lending method: individual, group and combination. The sample was selected from all three groups by taking into consideration the time and costs to conduct the interviews since many MFIs are located in remote areas.

Face-to-face interviews were conducted in the MFI office in two phases (see Table 6.1). The name of the institution is coded alphabetically to maintain the confidentiality and privacy of participants and MFIs. The first phase was conducted from June 2018 until August 2018 and the second phase was conducted from June 2019 until July 2019. There are 16 respondents that were interviewed in the first phase and 4 respondents in the second phase so that the total of 20 respondents of 20 MFIs were successfully interviewed. Beforehand, the interviewer obtained respondents' approval to be voluntarily interviewed and audio-recorded during the interview process. The duration of the interview for each participant ranged between 50 minutes and 1 hour.

Table 6.1 Interview dates

No	MFI	Interview Date
1.	MFI A	11 May 2018
2.	MFI B	16 May 2018
3.	MFI C	16 May 2018
4.	MFI D	3 May 2018
5.	MFI E	7 May 2018
6.	MFI F	7 May 2018
7.	MFI G	9 May 2018
8.	MFI H	9 May 2018
9.	MFI I	4 May 2018
10.	MFI J	19 July 2018
11.	MFI K	2 May 2018
12.	MFI L	11 July 2018
13.	MFI M	19 July 2018
14.	MFI N	9 July 2018
15.	MFI O	19 July 2018
16.	MFI P	2 May 2018
17.	MFI Q	13 June 2019
18.	MFI R	13 June 2019
19.	MFI S	14 June 2019
20.	MFI T	25 June 2019

All the interviews were transcribed word for word from the audio recordings. The transcriptions were then stored in NVivo 12, qualitative data analysis software from QSR International, for analysis. Prior to the analysis, each script was read at least two times to become familiar with the data and grasp the important details. Data were analysed by the researcher according to the thematic analysis. The data were coded with a combination of priori and pure inductive approaches (Miles & Huberman, 1994, p. 61). The starting list of codes was generated from the conceptual frameworks, research questions, and other key details of the study. The list was then updated by reading the interview transcripts through an inductive process. Themes were extracted from the code or combination of several codes.

Five lending methodology related themes emerged from the interviews. The first theme is funding sources for the microfinance lending activity. This covers a discussion about initial funding, savings mobilisation, and other sources of funding. The second theme is about farmer groups. The groups are importantly related to how the microfinance institution chose the lending methodology. The third theme discusses lending methodology. The discussion is categorised into loan delivery method of microfinance (individual and group). The fourth theme discusses how microfinance deals with non-performing loans. The last theme is about competition in the micro credits market.

6.3. Funding source of lending

Microfinance receives funding from several different sources including initial capital, savings, and other sources. The funding sources are related to the legal form of microfinance. Table 6.2 shows that the legal form of nineteen MFIs are co-operatives. MFI P is the only microfinance which is formed as a limited liability company.

Cooperatives in the Law of the Republic of Indonesia No. 25 Year 1992 concerning Cooperatives are defined as business entities whose members or legal entities are cooperatives by basing their activities on cooperative principles as well as a people's economic movement based on the principle of kinship. Whereas, limited liability is defined in the Law of the Republic of Indonesia number 40 year 2007 concerning Limited Liability Companies as a legal entity which is a capital alliance, established based on an agreement, conducts business activities with authorised capital which is entirely divided into shares and meets the requirements stipulated in this law and implementing regulations.

Table 6.2 Microfinance legal form

No	MFIs	Legal Form
1.	MFI A	Co-operatives
2.	MFI B	Co-operatives
3.	MFI C	Co-operatives
4.	MFI D	Co-operatives
5.	MFI E	Co-operatives
6.	MFI F	Co-operatives
7.	MFI G	Co-operatives
8.	MFI H	Co-operatives
9.	MFI I	Co-operatives
10.	MFI J	Co-operatives
11.	MFI K	Co-operatives
12.	MFI L	Co-operatives
13.	MFI M	Co-operatives
14.	MFI N	Co-operatives
15.	MFI O	Co-operatives
16.	MFI P	Limited liability
17.	MFI Q	Co-operatives
18.	MFI R	Co-operatives
19.	MFI S	Co-operatives
20.	MFI T	Co-operatives

6.3.1 Initial funding

The initial funding for most sample MFIs was from the government budget, which was granted in the form of revolving credit to farmers and small businesses, except for a few microfinance institutions which were funded by member contribution or government investment. A table in Appendix 6.1 presents a list of MFIs and sources of capital. There are 16 institutions originating from the transformation of government programs (PUAP) into MFIs. PUAP or *Pengembangan Usaha Agribisnis Pedesaan* (Village Agribusiness Development) is a government program (Ministry of Agriculture) to help improve the welfare of farmers. This program was launched in 2008 by providing revolving funds to farmer groups in rural areas. In addition to financial assistance, the farmer group also received assistance from a facilitator called "*Penyelia Mitra Tani*" who are hired from the local government staff. The PUAP program ended in 2016 and was discontinued in the subsequent government administration. The amount of funds given to each farmer group is Rp100 million (\pm USD7,000). The fund is from the central government budget in the form of grants (unconditional cash transfer) to farmer groups in villages in Indonesia. These grants are then rolled out to farmers through farmer groups in the form of low interest loans.

MFI P was a transformation of a local government owned financial institution. The initial capital investment was from the local government budget. After the transformation, local government owns 99% of the microfinance shares and a cooperative owns the 1% shares.

MFI I was the result of the transformation of a government program called *Lembaga Keuangan Desa (LKD)* which was one of the Central Java provincial government programs which began in 2001. This program provided a grant of Rp50 million (\pm USD4,000) to the village government to build a financial institution engaged in savings and loans in the village.

MFI K was a transformation of *Kelompok Usaha Bersama (KUB)* which is a group established by the village community. This group received technical assistance from the central government. It was under the regulation of three ministries: 1) the Ministry of Industry; 2) the Ministry of Social Affairs; and 3) the Ministry of Maritime Affairs. The group financing came from the member contributions. Utilisation of funds is for lending and financing of production equipment.

MFI O is privately owned by cooperative members. According to the respondent, this microfinance is a family owned cooperative. The capital was entirely from the contribution of the founding members.

Seven respondents expressed concerns about managing the government-funded programs due to a stigma that grants are "social" aids unnecessary to be repaid to the government. As the respondents put it:

...mindset nya orang desa seperti itu, ini bantuan pemerintah yo diwenehi ndak usah dibalekno, ... Jadi ini uang negoro gitu uang negoro ndak usah dikembalikan. (MFI C)

...that is the mindset of villagers, this is aids that government gave us, not need to pay it back, ... So this is the government money, it doesn't need to be returned.

...Dari uang 100 juta [hibah pemerintah] itu, memang banyak orang yang meragukan. Dalam artian yang menjadi salah satu momok bagi pengurus itu biasanya yang namanya uang hibah itu bisa dikatakan sama masyarakat itu uang semacam uang yang misal mau dipinjam itu tidak perlu dikembalikan. (Respondent of MFI E)

...there are indeed many people who doubt the 100 million [government grant]. In the sense that, it is the scourges for the administrators, the community perception is that the grant is money that the borrower does not need to return.

The moral hazard was also from the village administrative officers which were mentioned by three of the seven respondents. The officers received first-hand information about the funding source of the program and might benefit from it. The involvement of the officers was in all government funded MFIs.

According to two respondents in Kendal regency, most government funded credit-programs failed. Respondent of MFI D mentioned 16 programs that survived while hundreds of others in Kendal regency failed. Respondent of MFI E added that there were 15 programs in its districts who received the funds but only two programs survived.

The fund labelled as a grant seems to cause problems to the management of the fund. As one respondent remarked, there is a regency in Central Java province which has more than 200 villages and almost all of them received the grants. Currently there are only about 15 programs in 15 villages that are still operating while the rest have failed.

6.3.2 Saving mobilisation

In addition to initial capital from the government, MFIs raise funds from deposit mobilisation. Table 6.3 shows different types of savings of microfinance. The three most

common types of savings are: First, principal savings are mandatory and collected once for the first time borrower. This is a requirement for new membership in a cooperative microfinance. The amount of savings range between Rp5,000 to Rp50,000 or USD0.36 to USD3.62.

Second, monthly mandatory savings are collected every month. This is also mandatory for all borrowers who are taking a loan from microfinance. The amount of the mandatory loan is smaller than principal savings, ranging from Rp1,000 to Rp5,000 or less than one cent on the dollar.

Third, voluntary saving is a non-mandatory saving plan for borrowers and non-borrowers. Basically, the savings can be withdrawn at any time by the account holder. Some respondents said that it is not easy to attract savings into microfinance. Some microfinance launched an attractive savings product with a specific purpose such as "*Tabungan Hari Raya*". This is similar to a time deposit but the money can only be withdrawn once when approaching the celebration of "*Hari Raya*", a religious holiday for Moslems celebrated once in a year. Some Moslems in Indonesia celebrate the day by spending considerable amount of money for new clothes and special foods, and visiting family members. The savings plan helps these people to set aside their income for this purpose.

Both principal and monthly mandatory savings are not on demand deposits. Principal savings can be withdrawn only when a person leaves membership in the microfinance, which makes the person ineligible for future loans from the microfinance. Meanwhile, monthly mandatory savings can be withdrawn any time after the account holders have paid off their loan. Withdrawal of the savings does not cause loss of membership in the microfinance.

Table 6.3 Saving mobilisation

No	MFI	Legal Form	Saving
1.	MFI A	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp50,000 Monthly mandatory savings Rp5,000 Voluntary savings
2.	MFI B	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp5,000 Monthly mandatory savings Rp5,000 Voluntary savings
3.	MFI C	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp25,000 Monthly mandatory savings Rp5,000 Voluntary savings Time deposits
4.	MFI D	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp50,000 Monthly mandatory savings Rp5,000 Voluntary savings (specific purpose)
5.	MFI E	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp30,000 Monthly mandatory savings Rp1,000 Voluntary savings
6.	MFI F	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp50,000 Monthly mandatory savings Rp5,000 Voluntary savings
7.	MFI G	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp10,000 Monthly mandatory savings Rp2,500 Voluntary savings
8.	MFI H	Co-operatives	<ul style="list-style-type: none"> Not known
9.	MFI I	Co-operatives	<ul style="list-style-type: none"> Loan deposits Rp25,000 (once when the loan is granted) Voluntary savings Time deposits
10.	MFI J	Co-operatives	<ul style="list-style-type: none"> No savings is collected.
11.	MFI K	Co-operatives	<ul style="list-style-type: none"> Principal savings Monthly mandatory savings Voluntary savings (specific purpose)
12.	MFI L	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp50,000 Monthly mandatory savings Rp5,000
13.	MFI M	Co-operatives	<ul style="list-style-type: none"> Principal savings Monthly mandatory savings Rp1,000 Voluntary savings (specific purpose)
14.	MFI N	Co-operatives	<ul style="list-style-type: none"> Principal savings Monthly mandatory savings
15.	MFI O	Co-operatives	<ul style="list-style-type: none"> Principal savings Monthly mandatory savings Voluntary savings
16.	MFI P	Limited liability	<ul style="list-style-type: none"> Loan deposits at least 1% of loan amount Time deposits
17.	MFI Q	Co-operatives	<ul style="list-style-type: none"> Principal savings Monthly mandatory savings Voluntary savings Loan deposits at least 10% of loan amount
18.	MFI R	Co-operatives	<ul style="list-style-type: none"> Not known
19.	MFI S	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp20,000 Monthly mandatory savings Rp2,000 Voluntary savings
20.	MFI T	Co-operatives	<ul style="list-style-type: none"> Principal savings Rp50,000 Loan deposits 2% of loan amount

Another type of savings in microfinance is loan deposit. It is a mandatory deposit for all microfinance borrowers. The deposit amount ranges from 1% to 10% of loan amount and is collected when the loan is disbursed. The deposit can only be withdrawn when the loan has been paid off.

The four types of savings above generally do not earn interest on a monthly basis. Instead, microfinance shares a portion of the profit to the savings account, although in some cases savers do not receive the profit at all. The individual amount of savings is relatively small so that if interest revenue is calculated on a monthly basis, it will be immaterial. This may be the reason why in microfinance it is difficult to mobilise savings from the public. Savings are unattractive because they do not provide competitive and regular interest revenues to the savers.

Microfinance savings products that provide interest on a monthly basis and in competitive percentages are term or time deposits. Three microfinance institutions provide this deposit product. This is not mandatory saving and can only be withdrawn in a specific time period. The deposit offers monthly and competitive interest revenues to the depositor. Since it is a costly fund, the microfinance offering this product will charge higher lending rates to the borrowers.

6.3.2 Other sources of funding

Savings might not be effective to accelerate fund mobilisation for many MFIs. The principal and mandatory savings are generally small. The fund accumulation through this channel could be a lengthy process. Likewise, voluntary saving is not an easy option for MFIs. Competitors like commercial banks offer depositors more attractive incentives and saving guarantees. As one respondent put it,

...setelah ada putusan dari Rapat Anggota Tahunan kemarin, kita buka tabungan. Tapi dari LKM saya baru satu orang yang nabung. (Respondent of MFI D)

...after decided in the last Annual Member Meeting, we launched saving product. But there was only one person who deposited in my MFI.

Funding from commercial banks is also costly for microfinance. The banks offer high interest rates that will leave microfinance with a negative margin spread. The following participants said that:

...yang dari Provinsi sempat memberikan akses kita ke Bank Jateng, tapi ternyata bunganya malah lebih tinggi. (Respondent of MFI E)

...Province Government offered access to Bank Jateng, but the interest rates are much higher.

Saya sebenarnya sih sudah pernah ngobrol-ngobrol [dengan bank],...tak hitung-hitung saya ndak [masuk hitungan], ndak usah lah.

I actually have talked [to a bank],...after calculated, it was infeasible, it was cancelled. (Respondent of MFI K)

The interviews revealed that limited access to external funding might restrict expansion of microfinance lending and outreach. Credit demand cannot be fulfilled, as expressed by the following respondents:

begitu anggota [koperasi] mengajukan [kredit] saya tidak bisa memenuhi dan harus antri... (Respondent of MFI K)

When a [cooperative] member applied for [loan] I could not fulfil it and [the member] must queuing....

...kembali lagi kemampuan dari pada LKM sendiri kan dananya terbatas, Pak. Sehingga gak mungkin kita bisa men-cover semua usulan ataupun masukan-masukan berkaitan dengan pengajuan pinjaman ke LKM. (Respondent of MFI H)

...back again to the ability of the MFI with limited fund, Sir. Thus it is impossible to cover all loan proposal or applications to the MFI.

...karena keterbatasan modal utamanya. Karena satu kelompok kan minimal lima [orang]... Kalau misalkan satu orangnya pinjam, eeh, dua jutaan, itu kan udah sepuluh juta satu kelompok. Lah, itu kan untuk mencairkan sepuluh jutanya itu kan lama banget ngumpulkannya... (Respondent of MFI C)

...for the reason mainly of limited capital. One group consists of five [people]...if let's say one person borrow two million [Rupiah], it needs ten million in cash for one group. It takes long time to collect that amount to lend...

6.3 Farmer group and microfinance

This section gives a description of the region where this study was conducted to contextualise this study. Central Java (*Jawa Tengah*) is a province in the Java island of Indonesia which covers an area of more than 32 Km². The capital of the province is Semarang, which has a population of 1.57 million people (Bureau of Statistics, 21 January 2019). There are 35 regencies and 6 municipalities under the administration of Semarang province, as shown in Table 6.4.

Table 6.4 The Central Java provincial governments

No	Regencies/Municipalities	Cities	No. of Districts	No. of Villages
Regency				
1.	Banjarnegara	Banjarnegara	20	266
2.	Banyumas	Purwokerto	27	301
3.	Batang	Batang	15	239
4.	Blora	Blora	16	271
5.	Boyolali	Boyolali	19	261
6.	Brebes	Brebes	17	292
7.	Cilacap	Cilacap	24	269
8.	Demak	Demak	14	243
9.	Grobogan	Purwodadi	19	273
10.	Jepara	Jepara	16	184
11.	Karanganyar	Karanganyar	17	162
12.	Kebumen	Kebumen	26	449
13.	Kendal	Kendal	20	266
14.	Klaten	Klaten	26	391
15.	Kudus	Kudus	9	123
16.	Magelang	Mungkid	21	367
17.	Pati	Pati	21	401
18.	Pekalongan	Kajen	19	272
19.	Pemalang	Pemalang	14	211
20.	Purbalingga	Purbalingga	18	224
21.	Purworejo	Purworejo	16	469
22.	Rembang	Rembang	14	287
23.	Semarang	Ungaran	19	208
24.	Sragen	Sragen	20	196
25.	Sukoharjo	Sukoharjo	12	150
26.	Tegal	Slawi	18	281
27.	Temanggung	Temanggung	20	266
28.	Wonogiri	Wonogiri	25	251
29.	Wonosobo	Wonosobo	15	236
Municipality				
30.	Magelang	-	3	-
31.	Pekalongan	-	4	-
32.	Salatiga	-	4	-
33.	Semarang	-	16	-
34.	Surakarta	-	5	-
35.	Tegal	-	4	-

(extracted from various sources)

All the interviews were conducted in Central Java province. Most of the MFIs (7 offices) are in the Grobogan regency, which is about 80 km from Semarang, the capital city. Four MFIs are in Kendal regency, which is about 50 km from Semarang. Each of the two MFIs in Semarang regency are in the Semarang municipality. One MFI is located in each of Jepara regency and Pati regency, which are about 75km and 85km from Semarang capital city, respectively.

Many regions of Central Java are fertile agricultural areas. Most microfinance institutions are operating rural villages surrounded with farming activities. Respondent of MFI O described the area this way:

Petani di sini kan musiman, Pak. Sekarang lagi musim tembakau. Kemarin musim padi. Padi sudah selesai sekarang ditanami tembakau. Kemarin musim melon. Gitu, tergantung musim-musimnya sini, Pak.

Here are seasonal farmers. It is tobacco season now. It was the rice season before. The rice season is over and is now planted with tobacco. Previously was melon season. Well, it depends on the seasons here.

Respondent of MFI G also remarked on a similar situation:

Semua petani Pak artinya kelompok tani, kan, banyak anggotanya tuh.

All are farmers, meaning farmer groups with many members.

Respondent of MFI E described:

...Kendal masih terkenal dengan tembakau, itu kan ada hanya dua musim, padi sama tembakau. Itu per enam bulannya. Jadi kita sepakat pengurus kita pengguliran dana hanya untuk musiman saja. Jadi per enam bulan. Ya. Per enam bulan. Jadi kita pada saat pencairan dana itu pada saat musim tanam, dan nanti jatuh tempo pengembalian itu pada saat panen, enam bulan sekali...

...Kendal is still famous for tobacco, only two seasons, rice and tobacco. That's every six months. So we agreed that funds are only rolled out seasonally, every six months. Disbursement of funds is during the growing season, and the maturity of the loan is at harvest, once every six months...

Another description provided by Respondent of MFI F:

Biasanya mayoritas petani. Tapi ada yang pedagang, ada yang karyawan juga. Pedagang tapi ya juga jual belinya ya hasil pertanian.

The majority are farmers. But there are traders and employees too. The traders sell agricultural products.

These interviews indicate that agriculture is an important activity to support the local community. It influences the loan repayment to the microfinance institutions. The farmers can sell their products at every harvesting season, depending on the crop types. Most common harvesting time is every three or six months. In addition, the farming activities usually need collective efforts to support the farmers themselves. The farmers commonly make a group that consists of members from farmers in the same village. This group often receive assistance from government in the forms of training, seeds, fertilizers, or funding. Some microfinance institutions distribute loans to these groups. The group mechanism helps the microfinance institutions to collect and ensure repayment from the members. Group lending through the farmer groups are quite common in the microfinance institutions in Central Java province.

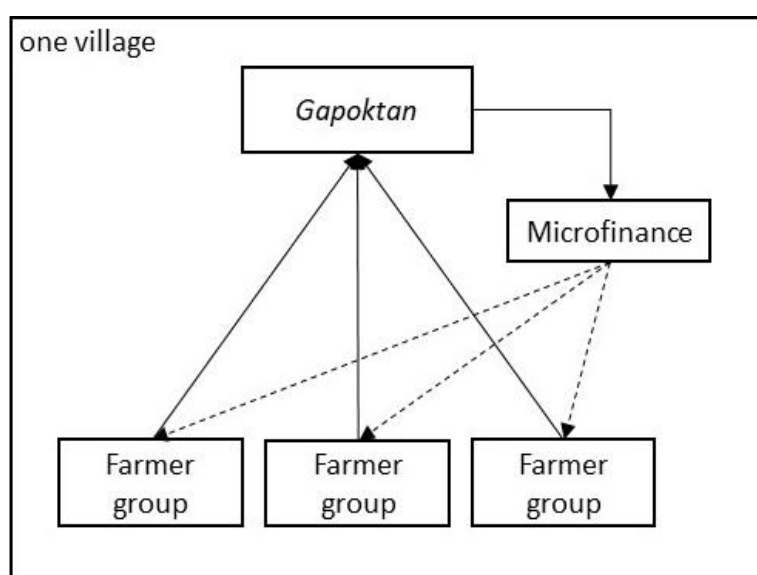
Interviews revealed that *Kelompok Tani (Poktan)* or farmer group is an important part of the PUAP microfinance activities. The majority of microfinance samples are transformations of the PUAP government program. There are 16 microfinance samples from PUAP and 4 others are non-PUAP programs. The government PUAP assistance was initially granted to farmer groups in a village. The farmer group is led by a group leader. The number of farmer groups in a village varies, depending on the area and population. Table 6.5 shows the number of groups and the number of sub-villages in one village which is the scope of the microfinance. The number of farmer groups ranges from 2 to 9 groups. One village has 2 to 9 sub-villages. The members in farmer groups vary depending on the population in every village and sub-village. In contrast, the other four sample microfinance institutions did not originate from the PUAP program. These microfinance institutions are not directly related to farmer groups. This section will specifically discuss farmer groups and their relationship with microfinance.

Table 6.5 Farmer groups distribution

No	Microfinance	Numbers of group	Coverage
1.	A	2 groups	2 sub-villages
2.	B	2 groups	2 sub-villages
3.	C	5 groups	unknown
4.	D	2 groups	6 sub-villages
5.	E	4 groups	5 sub-villages
6.	F	2 groups	3 sub-villages
7.	G	4 groups	3 sub-villages
8.	H	6 groups	3 sub-villages
9.	J	9 groups	7 sub-villages
10.	L	8 groups	8 sub-villages
11.	M	8 groups	8 sub-villages
12.	N	2 groups	unknown
13.	Q	7 groups	6 sub-villages
14.	R	9 groups	unknown
15.	S	6 groups	unknown
16.	T	8 groups	9 sub-villages

Farmer groups in one village joined an association which is called the Joint Farmers Group or *Gabungan Kelompok Tani (Gapoktan)*. This Gapoktan already existed before the government disbursed PUAP grants to the groups. Prior to transformation into microfinance, Gapoktan had provided loans to its members in the poktan. Gapoktan generally has several business units and one of them provides loans to the members. This lending unit was then transformed into microfinance (see Figure 6.1).

Figure 6.1 Farmer group structure



Source: author

Farmers who join farmer groups do not always have the same type of crop. As explained by Respondent of MFI E, one group of farmers do not specialise in one particular type of

plant. Members in a farmer group have various types of plants, including onions, rice, watermelons, and tobacco. The type of plant also depends on the weather. For example, farmer groups of microfinance G have weather dependent plants. The main crop of the farmers is rice which is planted during the rainy season. During the dry season, farmers switch to secondary crops such as potatoes, sweet potatoes, carrots, and corn. These plants do not need as much water as rice.

Both the farmer group and the *Gapoktan* conduct regular meetings. These meetings are conducted by the individual group every month and are attended by the members of the farmer group. Besides the farmer group meeting, the *Gapoktan* also holds a meeting which is attended by the farmer group leaders. This meeting is commonly carried out every six months. The meeting discusses various issues in relation to farming and also about microfinance lending. The microfinance administrator is involved in the meetings and often uses the opportunity to collect and disburse loans.

Some farmer groups have group cash. The money, which is collected from members every month, is used for various purposes such as group meetings logistics and fertiliser procurement. In addition, some groups also use the money to pay off group member debt arrears to microfinance. However, not all groups allow group cash contributions to be used to cover members' debts to microfinance. Group cash is a contribution from all members of the farmer group, but not all members of the farmer group take up loans from microfinance.

6.4 Lending Methodology

Lending methodology is related to the microfinance funding. Interviews revealed that microfinance loans are basically provided with two types of methodology, group and individual (see Table 6.6). Nine microfinance institutions provide loans individually. Six microfinance institutions provide loans with a group method, while five other microfinance institutions provide both individual and group loans. Group loans are only provided by microfinance from the PUAP program. Whereas all non-PUAP microfinance uses individual lending methods.

Table 6.6 Microfinance lending methodology and funding source

No	MFI	Lending Method	Funding
1.	MFI A	Group	PUAP microfinance
2.	MFI B	Individual	PUAP microfinance
3.	MFI C	Group & Individual	PUAP microfinance
4.	MFI D	Individual	PUAP microfinance
5.	MFI E	Individual	PUAP microfinance
6.	MFI F	Individual	PUAP microfinance
7.	MFI G	Group	PUAP microfinance
8.	MFI H	Group	PUAP microfinance
9.	MFI I	Individual	Non-PUAP microfinance
10.	MFI J	Group & Individual	PUAP microfinance
11.	MFI K	Individual	Non-PUAP microfinance
12.	MFI L	Group	PUAP microfinance
13.	MFI M	Group	PUAP microfinance
14.	MFI N	Individual	PUAP microfinance
15.	MFI O	Individual	Non-PUAP microfinance
16.	MFI P	Individual	Non-PUAP microfinance
17.	MFI Q	Group & Individual	PUAP microfinance
18.	MFI R	Group & Individual	PUAP microfinance
19.	MFI S	Group & Individual	PUAP microfinance
20.	MFI T	Group	PUAP microfinance

6.4.1 Microfinance with individual lending

Table 6.7 shows loan requirements and guarantees of individual lending microfinance. The loan requirement is relatively simple. It only requires copies of documents such as an identity card and “family card”. A family card is an official document that contains information about the list of family members, issued by local government. Some PUAP microfinance also requires membership in farmer groups and approval from the group leader. Whereas non-PUAP microfinance has no historical relationship with farmer groups as with PUAP microfinance, so that the membership requirement is not commonly used.

Table 6.7 Loan requirement and collateral

No	MFI	Funding	Requirement	Collateral
1.	MFI B	PUAP	<ul style="list-style-type: none"> • Membership in farmer group • Copy of identity card • Copy of "family card", an official list of family members 	<ul style="list-style-type: none"> • No collateral is required
2.	MFI D	PUAP	<ul style="list-style-type: none"> • Copy of identity card • Copy of "family card" listing family members • Approval from farmer group leader 	<ul style="list-style-type: none"> • No collateral is required. However, 5% of loan amount is retained by microfinance as loan guarantee.
3.	MFI E	PUAP	<ul style="list-style-type: none"> • Approval from farmer group leader • Copy of identity card 	<ul style="list-style-type: none"> • No collateral is required
4.	MFI F	PUAP	<ul style="list-style-type: none"> • Copy of identity card 	<ul style="list-style-type: none"> • Rp2 million or bigger loans require collateral (copy of vehicle certificate)
5.	MFI I	Non-PUAP	<ul style="list-style-type: none"> • Copy of identity card • Copy of "family card", an official list of family members 	<ul style="list-style-type: none"> • Collateral (copy of vehicle or land certificate)
6.	MFI K	Non-PUAP	<ul style="list-style-type: none"> • Copy of identity card • Mandatory saving payment 	<ul style="list-style-type: none"> • No collateral is required
7.	MFI N	PUAP	<ul style="list-style-type: none"> • Copy of identity card • Copy of "family card" listing family members 	<ul style="list-style-type: none"> • No collateral is required
8.	MFI O	Non-PUAP	<ul style="list-style-type: none"> • Copy of identity card • Copy of "family card" listing family members 	<ul style="list-style-type: none"> • Vehicle certificate or • Land certificate
9.	MFI P	Non-PUAP	<ul style="list-style-type: none"> • Copy of identity card • Copy of "family card" listing family members • Passport photo 	<ul style="list-style-type: none"> • Vehicle certificate or • Land certificate or • "Kartu Pasar"

6.4.1.1 Loan requirement

Collateral is a necessary requirement for loan application in most non-PUAP microfinance. The collateral is generally vehicle or land certificates. Besides the certificates, borrowers of MFI P can use a *Kartu Pasar* (market card) as loan collateral. This card is basically a license issued by the local authority to trade in the market. Traders who have the licence are given 2x3 meters space to display their goods in a market located near the microfinance institution. The card is transferable and marketable. MFI P allows market card holders to apply for loans guaranteed by the card. Loan values are generally 50-60% of the card value.

MFI K does not require collateral for the loan. Respondent of MFI K explained that the microfinance's capital was fully funded from contributions of the member themselves so that it would be unreasonable to require loan collateral from its owners. The microfinance institution did not receive external funding such as from the government or public deposits mobilisation.

In contrast to the non-PUAP, a collateral requirement is not common in PUAP microfinance institutions except MFI F and MFI D. The MFI F requires a vehicle certificate as loan collateral only for loans bigger than Rp2 million (approximately USD145). MFI D retains 5% of the loan amount as a loan guarantee. This deposit can be withdrawn by the borrower after the loan is fully repaid. Although the deposit is retained, the amount seems negligible relative to the loan size and it is not from the borrower's pre-existing assets. This guarantee might not have significant "collateral effects" on the borrowers as suggested by the theory. It will not screen out borrowers who do not own collateral and might have a small behavioural incentive impact on the borrowers.

6.4.1.2 Borrower selection

Selection is a crucial step for lenders to obtain credible borrowers. Based on interviews, there are two main sources of information that MFIs use to assess credibility, as shown in Table 6.8. First, respondents frequently mentioned "borrower's character" as important information to microfinance to screen borrowers. The respondents related character to client credit history. Borrowers are of good character if there are no defaulted loans with previous lenders. Microfinance must find the information themselves because microfinance does not have access to the "Debtor Information System" from the regulator. Access to this is only available to formal banks. Some statements from the respondents affirmed the importance of character information to borrower selection. Respondent of MFI D said:

...kita sedikit banyak sudah tahulah karakter masing-masing kan itu kan kalau masih lingkup satu desa kan kita kan masih istilahnya sedikit banyak masih tahulah karakter si A, si B-nya itu kan.

...more or less we already know the character of each client. If it is still within the scope of one village, we still know the character of the A or B people.

Respondent of MFI E:

Kalau melalui kelompok tani kan tahu, wah ini orangnya si A karakternya baik. Ini suka pinjam bank ini, ini, ini, masih banyak masalah kan. Amannya, kita cari amannya.

If through a farmer group, we know the character of person A, he is borrowing from many other banks, or there are still many problems. We are looking for the safest way.

Respondent of MFI N:

Dia punya hutang sebelum bagaimana. Tapi kalau hutang di luar LKM kan kita juga menilai...

How the client's previous debt was. We also assess how the person's debt with other lenders besides the MFI ...

Table 6.8 Borrower information source and screening

No	MFI	Funding	PUAP microfinance
1.	MFI B	PUAP	Borrower's character
2.	MFI D	PUAP	Borrower's character
3.	MFI E	PUAP	Borrower's character
4.	MFI F	PUAP	Borrower's character
5.	MFI I	Non-PUAP	Financial information
6.	MFI K	Non-PUAP	Borrower's character
7.	MFI N	PUAP	Borrower's character
8.	MFI O	Non-PUAP	Financial information
9.	MFI P	Non-PUAP	Financial information

MFI's obtain information about a client's character from various sources. Information from farmer group leaders is one important source of information for PUAP microfinance. Other sources of information are from a client's neighbours or village administration officers. PUAP microfinance operates within the scope of one village, thereby facilitating the investigation of client information. Social connectedness among the village people is strong, which makes transmission of personal information among villagers quicker.

Second, financial condition is the other information that microfinance institutions can use to select borrowers. This information not available on an audited financial reports. Information is obtained from surveys of the client's business and interviews. It requires more advanced skills of the credit officers and may only be possible for larger microfinance.

Respondent of MFI I:

Terus dari situ kan kita menggali informasi dari nasabah yang bersangkutan. Khususnya untuk yang perorangan seperti ini kan kita hanya langsung ke debitur langsung. Kita gali informasi kemampuan. Khususnya kalau di desa itu kemampuan bayarnya berapa per bulan gitu.

We gather information from customers. Especially individuals, we go directly to the debtor. We dig information about its capabilities. Especially in the village, how much is their ability to repay monthly?

Respondent of MFI O:

Yang pertama berdasarkan hasil survei, Pak. Kita kan adakan survei. Walaupun di saya karyawannya tiga itu kita bisa bagi kerjaan, Pak. Jadi gak--, ya memang kalau di struktur organisasi manajer, marketing, kasir kan gantian, Pak. Manajer, kasir sama marketing. Tapi untuk pelaksanaan kerja itu gantian, Pak. Saya juga survei.

The first is based on survey results. We will have a survey. Even though there are only three employees, we can work. If there are managers, marketing and cashiers in the organisational structure, we take turns. I also did a survey.

Respondent of MFI P:

Ya analisa. Kan tadi kreditnya kan juga ndak terlalu banyak. Ndak terlalu banyak, sudah dianalisa mungkin dia hasil usaha tiap hari atau tiap buka pasaran itu hasilnya kan sudah kelihatan. Kan bertanya dulu pendapatannya, omsetnya berapa. Terus untuk biayanya berapa,...

Yes, analysis. The loan amount is not big. In the analysis of daily business income or every market opening day, the results can be observed. You ask first about the income, how much turnover is. Then how much it costs...

6.4.2 Microfinance with group lending

Based on the interviews, group loans are given to groups of people who are jointly responsible for the repayment. The term that is often used for the joint responsibility is "*tanggung renteng*". Table 6.9 shows the how respondents described the jointly liable lending. Farmer group leaders usually take responsibility for performance of the group loan. Farmer groups that cannot pay off the loan are not allowed to apply for a new loan. This sanction is applied not only to borrowing members, but also to non-borrowing farmer group members. Members who do not repay loans receive pressure from both borrowing and non-borrowing farmer group members. Group sanction and peer pressure are important characteristics of the group lending.

Table 6.9 Group lending method

No	MFIs	Funding	Lending method
1.	MFI A	PUAP microfinance	<ul style="list-style-type: none"> • If one of the members fails to repay, it will be the responsibility of the farmer group leader. • It reduces the costs of microfinance to collect the loan repayment.
2.	MFI G	PUAP microfinance	<ul style="list-style-type: none"> • If one member does not repay the loan, the whole group is not allowed to apply new loans in the subsequent period. • Peer pressure on the non-performing members.
3.	MFI H	PUAP microfinance	<ul style="list-style-type: none"> • If one member does not repay the loan, the whole group will not get loans in the subsequent period. • The microfinance institution does not become involved in the default loan settlement process in the borrowing group.
4.	MFI L	PUAP microfinance	<ul style="list-style-type: none"> • The unpaid loan will be solved by the borrowing group. • The microfinance institution does not become involved in the default loan settlement process in the borrowing group.
5.	MFI M	PUAP microfinance	<ul style="list-style-type: none"> • Loan is given to the borrowing group. • The unpaid loan will be resolved by the borrowing group. • The microfinance institution does not become involved in the default loan settlement process in the borrowing group.
6.	MFI T	PUAP microfinance	<ul style="list-style-type: none"> • The group lending reduces: the operational costs, the efforts to screen the borrowers, and the risk of default. • The loan is jointly liable by the borrowing members. • The microfinance institution does not become involved in the default loan settlement process in the borrowing group.

Members of the borrowing group are a subset of farmer group members. Not all the farmer group members demand loans from microfinance. Borrower members can change at any time depending on the financing needs of the members. The loan application was proposed by the farmer group leader to the microfinance institution.

According to MFIs A and T, the lending group helps them to minimise costs and risks. The microfinance institution does not require costs for collecting repayments from individual borrowers. The member repayments are collected by the group leader who then pays it to the microfinance institution. Group screening also minimises the costs of screening borrowers. The screening is carried out by the farmer group leader. Microfinance institutions utilise the informational advantage of the farmer group leader to obtain creditworthy borrowers. In addition, the default risk can be shifted to groups by using peer pressure and group sanction.

6.4.2.1 Loan requirements

Table 6.10 shows collateral requirements for group lending. There is no collateral requirement of the group lending except MFI G, which requires the farmer group pledges farmer group cash as a loan guarantee. Although most farmer groups have group cash, microfinance often cannot require the cash to be used as collateral for loans. The cash is collected from all members of the farmer group, although some members who have never borrowed money from the microfinance might not be willing to use group cash as a guarantee for other member loans.

Table 6.10 Group lending collateral

No	MFIs	Funding	Collateral
1.	MFI A	PUAP microfinance	1. No collateral is required
2.	MFI G	PUAP microfinance	2. No collateral is required. Loan is guaranteed by farmer group cash.
3.	MFI H	PUAP microfinance	3. No collateral is required
4.	MFI L	PUAP microfinance	4. No collateral is required
5.	MFI M	PUAP microfinance	5. No collateral is required
6.	MFI T	PUAP microfinance	6. No collateral is required

For MFI G, the personal collateral is required for only additional loans requested by the group member only if the microfinance institution still has idle and loanable excess cash after all loans application of group lending have been fulfilled. The microfinance institution lends the money on an individual basis. These loans are usually bigger than a borrower receives with group lending. As the loan is bigger, the microfinance institution asks for collateral from the individual borrower to guarantee the loan repayment to minimize the risk of default. The group loan collateral is in the form of “group cash” which is owned by the whole members of farmer group. The group borrowing members are the subset of the farmer group members. Not all the farmer group members need loans at the same time. The use of group-cash as collateral requires an agreement of all the members of farmer group since the cash was collected regularly from all farmer group members even though some members do not borrow money from the microfinance institution. Therefore, some farmer groups do not allow microfinance institutions to use group-cash for loan collateral when there is no agreement among all members of a farmer group. In the case of group lending with group-cash collateral, there may be no impact on the social mission of the microfinance institution. Member(s) who have no personal asset as collateral can still obtain loan from the microfinance institution via group lending of farmer group. For wealthier farmer group members who have personal assets as collateral, they can apply for additional financing individually from the microfinance institution if there is loanable fund available.

6.4.2.2 Borrower selection

The borrower selection process in group lending is different from individual lending. Microfinance relies more on the farmer group leader in selecting members of the farmer group who will be given loans. Table 6.11 summarises borrower screening methods based on the interviews. The group leader is more familiar with the character of its members than are microfinance management. This information helps the group leader to determine members who can obtain loans from microfinance. The group leader shortlists applicant members that will be submitted to microfinance. Generally, the microfinance institution does not conduct further screening on the member list submitted by the group leader. However, the amount of loans submitted by the farmer groups is not always granted in its entirety by microfinance. Capital limitation often requires microfinance to limit the loan amount that each farmer group will receive. Allocation of funds to groups is discussed and decided together with all group leaders and microfinance.

Table 6.11 Borrower selection method

No	MFI	Funding	Borrower selection
1.	MFI A	PUAP microfinance	The leader of the farmer group has informational advantages about the borrowers and does the screening. Microfinance administrators have information about the farmer group members who domicile in the same village with the microfinance institution.
2.	MFI G	PUAP microfinance	Loan applicants must be a member of the farmer group. The leader of the farmer group selects creditworthy members before applying for a loan to the microfinance institution.
3.	MFI H	PUAP microfinance	Selection of group loan members is done by the farmer group leader. Microfinance relies on the decision of the farmer group.
4.	MFI L	PUAP microfinance	The selection process of the group loan members is conducted by the farmer group leader.
5.	MFI M	PUAP microfinance	The farmer group leader knows the character of the members. The borrower selection process is conducted by the farmer group
6.	MFI T	PUAP microfinance	The group loan member is selected by the farmer group. Microfinance relies on the decision of the farmer group. The farmer group has better information about their members than microfinance.

6.4.3 Microfinance with both individual and group lending

Table 6.12 shows microfinance that provides individual and group loans. All microfinance are PUAP programs. Some microfinance began to stop new lending to groups and moved to individual lending with various motivations. Good borrowers prefer individual

loans over group loans because they are not willing to assume the obligations of non-performing members. They cannot take subsequent loans and this can disrupt the continuity of good borrower businesses. One respondent said:

Kelompok itu 5 orang, 4 beres, yang 1 macet, sehingga dia tidak bisa mengambil lagi, dia pilih, memilih sendiri-sendiri. (Respondent of MFI J)

The group consisted of five borrowers, four performed well and one was default. Consequently, the four borrowers cannot take anymore loan. They chose to take loans individually.

Another reason is that there is a lack of demand for group lending because borrower groups are formed by members' initiatives without involvement from microfinance. Respondent of MFI C said:

...saya memanfaatkan yang sudah punya kelompok saja, saya ndak- malah saya kok ndak cari, mencari masalah nanti saya membuat kelompok, itu dia membuat kelompok kan inisiatif sendiri, bukan saya yang mbentuk, dia mbentuk sendiri, dikembangkan sendiri, sehingga sudah mandiri lah seperti itu, bukan saya, ndak usah saya yang bentuk nanti kalau saya yang bentuk masalah lagi.

...I make use of the existing groups. I do not want to make any problem by creating a new group. The group was initiated by the members, I did not create it. Thus the group was already independent. I do not want to be blamed if something goes wrong.

Table 6.12 Lending method

No	MFI	Funding	Lending method
1.	MFI C	PUAP microfinance	<ul style="list-style-type: none"> • No more group lending to farmer groups. • There are three groups that obtained group lending from microfinance. The groups are not farmer groups. • Microfinance provides individual loans to both the members and non-members of farmer groups. • The farmer group members directly apply for loans to the microfinance institution.
2.	MFI J	PUAP microfinance	<ul style="list-style-type: none"> • Microfinance only provides group lending to two farmer groups. • The microfinance institution stopped providing new group loans to farmer groups. • The microfinance institution provides individual loans to only the members of farmer groups.
3.	MFI Q	PUAP microfinance	<ul style="list-style-type: none"> • The microfinance institution provides both individual and group loans to only the members of farmer groups.
4.	MFI R	PUAP microfinance	<ul style="list-style-type: none"> • The microfinance institution provides both individual and group loans to only the members of farmer groups.
5.	MFI S	PUAP microfinance	<ul style="list-style-type: none"> • The microfinance institution provides individual loans to both the members and non-members of farmer groups. • The lending is prioritised to individuals. • Three groups still exist.

From the information, it shows that some group lending did not work well so the microfinance institutions are reluctant to develop or even stop the group lending. Two factors may cause the failure of the group lending. First, the borrower member selection process did not run effectively. The farmer group leader plays a very large role in determining who can be granted loans through the group. The group chair can directly reject members who apply for loans or provide recommendations to the microfinance institutions not to provide loans to members who are less credible. The responsibilities of group members are asymmetrical and that can cause negative-assortative matching group (Gangopadhyay and Lensink, 2014). Although negative-assortative matching can give higher efficiency (Reito, 2019), there is possibility that social pressure causes group leader to hesitate to directly refuse or recommend refusal to the microfinance institution for members loan application because the leader and group members live in the same village. The village scope is relatively small so that the social ties between the villagers are quite strong. In certain events such as weddings, village communities often help each other to organize these events so that the bonds of mutual need between villagers are strong. Second, peer pressure between members of the lending group is not going well. This can cause moral hazard by members who do not act in good faith (Simtowe et al., 2007). Low peer pressure among group members could be due to the availability of credit

sources from other financial institutions (Becchetti and Pisani, 2010). If a borrower can easily find other lenders as the sources of credits, the peer pressures and sanctions may not be sufficient to generate borrower discipline.

6.4.3.1 Loan requirements

Table 6.13 shows the document requirements and loan collateral for each microfinance institution. The main document requirement for applying for loans across all microfinance is a copy of an identity card. For group loans, identity card copies are only requested from the group leader. In addition to the documents, most individual and group loans require collateral. In some microfinance, loans above a certain amount (for example above Rp2 million) are required to pledge collateral. The collateral is land or vehicle certificates. Loans from Microfinance J are also guaranteed by 10% of the loan amount being retained by the microfinance institution. Microfinance Q does not ask for collateral for group loans. Microfinance Q made an agreement with the farmer group to use group cash as collateral for an outstanding loan. Microfinance R does not require collateral for both individual and group loans.

Table 6.13 Documents and collateral requirement

No	MFIs	Funding	Document	Collateral
1.	MFI C	PUAP microfinance	<ul style="list-style-type: none"> Copy of identity cards 	<ul style="list-style-type: none"> Collateral is required for group and individual lending. 1 collateral for 1 group. Land or vehicle certificates
2.	MFI J	PUAP microfinance	<ul style="list-style-type: none"> Copy of identity cards 	<ul style="list-style-type: none"> Collateral is required for loans above Rp5 million. Land or vehicle certificates. 10% of loan is retained by microfinance as loan guarantee.
3.	MFI Q	PUAP microfinance	<ul style="list-style-type: none"> Copy of identity cards 	<ul style="list-style-type: none"> Collateral is required for individual loans above Rp5 million. Land or vehicle certificates. No collateral is required for group loans. Farmer group cash is used to cover unpaid loans.
4.	MFI R	PUAP microfinance	<ul style="list-style-type: none"> Copy of identity cards 	<ul style="list-style-type: none"> No collateral is required for individual and group loans.
5.	MFI S	PUAP microfinance	<ul style="list-style-type: none"> Copy of identity cards 	<ul style="list-style-type: none"> Collateral is required for group and individual loans above Rp2 million. Land or vehicle certificates.

6.4.3.2 Borrower selection

Table 6.14 shows borrower screening method of the microfinance institutions. Applicant's character is the main consideration for credit decisions. Based on interviews, the term "character" is often used by respondents to describe the credit history of applicants. This character information is obtained from the people close to the applicant or from the leader of the farmer group. In a group loan, the farmer group leader plays an active role in seeking the information and in the selection of borrowers.

According to respondents, the information about loan applicant character can be easily obtained from the people close to the applicant (friends or neighbours) because the applicant is domiciled in one village with the microfinance institution or farmer group(s). One respondent said: "...*semua orang tahu mas, di desa itu gampang...*" ("...everyone knows, it is easy in a village..."). Another respondent added: "...*kalau di desa itu 'kan orang akrab...*" ("...people knows each other in a village...").

Table 6.14 Borrower selection method

No	MFI	Funding	Borrower selection
1.	MFI C	PUAP microfinance	<ul style="list-style-type: none"> Borrower's character is the main consideration for screening.
2.	MFI J	PUAP microfinance	<ul style="list-style-type: none"> Borrower's character is the main consideration for screening.
3.	MFI Q	PUAP microfinance	<ul style="list-style-type: none"> Borrower's character is the main consideration for screening. The leader of the farmer group provide information to the microfinance institution.
4.	MFI R	PUAP microfinance	<ul style="list-style-type: none"> The leader of farmer group provide information to the microfinance institution.
5.	MFI S	PUAP microfinance	<ul style="list-style-type: none"> Borrower's character is the main consideration for screening.

6.5 Dealing with non-performing loans

Table 6.15 shows the microfinance approaches to solve default loans. Most respondents of group lending microfinance presented group mechanisms in resolving default group loans. The interviewees affirmed that a group's internal mechanisms play an important role in recovering default loan repayments. Respondent of MFI A stated:

...kita menggunakan tanggung renteng Pak. Nah, dari salah satu, 3 orang itu yang tanggung rentengnya kan ada ketuanya. Nah, kalau yang ada yang macet yang nagih yang ketua tanggung rentengnya.

...we use joint liability. It the responsibility of the group leader. If there is default loan, it will be the responsibility of the leader to do the collection.

Similarly, a comment from Respondent of MFI H reiterated the importance of group internal mechanisms:

Kalau ada kemacetan paling tidak ya ditutup dululah urusannya untuk antarane kelompok ke kelompok itu. Gitu. Dan kelompok Pontan kan punya dana juga.

If there is default loan, at least it will be covered by the group. It will be discussed among the group. The farmer group has group cash as well.

In a situation where the group cannot repay the loan, microfinance imposes sanctions on the group by not providing loans in the next loan session. This sanction puts pressure on non-performing members. Respondent of MFI G said:

Kalau ada yang terlambat itu yang nekan itu banyak gitu lo. Anggota lainnya nekan, pengurus juga nekan.

If there is late repayment, the borrower receives pressure from others. Pressure from peer, also from the administrator.

Table 6.15 Lending methodology and loan enforcement

No	MFI	Funding	Lending Methodology	Loan enforcement
1.	MFI A	PUAP microfinance	Group	1. Resolved by the farmer group.
2.	MFI G	PUAP microfinance	Group	2. Resolved by the farmer group.
3.	MFI H	PUAP microfinance	Group	3. Resolved by the farmer group.
4.	MFI L	PUAP microfinance	Group	4. n.a.
5.	MFI M	PUAP microfinance	Group	5. Resolved by the farmer group.
6.	MFI T	PUAP microfinance	Group	6. Resolved by the farmer group.
7.	MFI B	PUAP microfinance	Individual	7. Loan contract renewal. 8. Village government office will hold off all administrative processes of a borrower until the loan is paid off.
8.	MFI D	PUAP microfinance	Individual	9. Persuasive approach.
9.	MFI E	PUAP microfinance	Individual	10. Loan contract renewal.
10.	MFI F	PUAP microfinance	Individual	11. Loan contract renewal with maximum of 2 periods.
11.	MFI I	Non-PUAP	Individual	12. Loan contract renewal or restructuring.
12.	MFI K	Non-PUAP	Individual	13. Persuasive approach.
13.	MFI N	PUAP microfinance	Individual	14. Persuasive approach.
14.	MFI O	Non-PUAP	Individual	15. Liquidation of collateral if persuasive approach is unsuccessful.
15.	MFI P	Non-PUAP	Individual	16. Loan contract renewal. 17. Liquidation of collateral is only for vehicle certificate. 18. Write-off the loan.
16.	MFI C	PUAP microfinance	Group & individual	19. Persuasive approach.
17.	MFI J	PUAP microfinance	Group & individual	20. Persuasive approach.
18.	MFI Q	PUAP microfinance	Group & individual	21. Persuasive approach.
19.	MFI R	PUAP microfinance	Group & individual	22. Persuasive approach.
20.	MFI S	PUAP microfinance	Group & individual	23. Persuasive approach.

Respondents from individual lending MFIs described different ways of resolving default loans. Although some loans are guaranteed with collateral, this is rarely liquidated to pay off a loan. A persuasive approach and loan contract renewal are two common methods used by the microfinance institution to recover the default loan. Respondent of MFI B explained the contract renewal:

Kecuali satu, dua tunggakan, mungkin ada pencairan terus diperbaharui gitu masih bisa. Kalau masih banyak--, kalau tunggakan banyak-banyak gak dikasih Pak biasanya.

If one or two instalments are unpaid, it is still possible for a new loan disbursement to renew the contract. If there are too many late instalments, the loan contract renewal will not be granted.

The respondent added:

Repotnya di situ, Pak. Maksudnya uang gak segitu besar ibaratnya, kalau dari pihak pengurus juga repot juga sih, Pak. Kalau ke rumah gak pernah dikasih, ke rumah gak pernah di kasih, kan gak enak juga gitu loh, Pak.

That is the problem. I mean that the loan amount is small. It is troublesome for management. If we come to the borrowers many times and they keep not paying the loan, it will be uncomfortable.

The comment of Respondent of MFI D also reflected a similar concern:

Maksimal ya bisanya nagih, itu aja. Kalau misalkan tidak ada realisasi pengembalian itu, ya, kita tidak bisa berbuat apa-apa karena tidak ada jaminan itu tadi.

Keep doing the collection is the maximum effort. If no repayment can be realised, we cannot do anything else because the loan is not collateralised.

Although some microfinance uses collateral to secure the loans, the collateral is rarely confiscated. Respondent of MFI O described this:

Kita pendekatan terus [peminjamnya]. Misalnya untuk bulan ini udah dua bulan, gantian yang nagih saya. Besoknya lagi teman saya, besoknya lagi teman saya, gitu. Akhirnya dengan pendekatan-pendekatan [peminjam] masih bisa ngangsur...

We keep approaching [the borrowers]. Let's say, I do collection in the first two months. After that, the process is continued by my peer. With this approach, [the borrower] can eventually pay off the loan..

...kalau memang ini sudah tidak bisa diangsur, ini kita musyawarahin sama peminjam itu gimana kalau--, misalnya jaminannya motor, motor itu kita jual. Kita jual gak dibeli di LKM, Pak, tapi kita jual di luar. Harganya berapa, nanti untuk nutup ke LKM berapa, sisanya kita kasih ke peminjam.

...if the loan definitely cannot be repaid, we discuss with the borrower the possibility of selling the collateral. Microfinance does not buy the collateral, instead it will be sold to others. Whatever the price is, it will be used to cover the debt to microfinance, and we give back the rest to the borrowers.

Respondent of MFI P also stated a similar line. The microfinance institution starts with a persuasive approach by communicating with the borrowers. If this approach is unsuccessful in recovering the loan, the microfinance continues on by confiscating the collateral.

Kami juga pernah untuk menyita kendaraan bermotor karna memang sudah nunggak. Dan kebetulan sudah lama tunggakannya. Cuma untuk nilai jualnya kan sudah turun. Dari mungkin sekian tahun dia pinjam, nilainya saat ini kan sudah turun sehingga tidak mencukupi...Tapi kebanyakan kalau orang umum itu kalau jaminan sudah diserahkan tahunya dia kredit lunas.

We have also confiscated motorised vehicles because the borrowers are already delinquent. It has been long arrears. However the selling price has gone down. After several years, the current value has gone down so it is not sufficient.... But most of the time, if the collateral has been handed over, the borrowers think the loan is already paid off.

In contrast, a persuasive approach is used by microfinance institutions that provide individual and group loans, to recover the defaulted loans. For example, Respondent of MFI J mentioned two cases of defaulted loans and both cases could be solved through personal and persuasive approach to the family members. Similarly, Respondent of MFI Q also emphasised the use of a persuasive approach to the family members and never confiscates the collateral to recover the loans. The respondent said “...dikasih tahu keluarganya dan anaknya yang nyicil sedikit-sedikit gitu” (“...tell the family members and their children to repay the loan gradually”). In a similar line, Respondent of MFI R expressed this:

Pendekatan ya itu sabar yang penting uangnya masuk ya bagaimana caranya kita bisa uang itu bisa anu-- bisa masuk ke LKM.

Approach patiently, the most important thing is that the money can be returned to the microfinance.

6.6 Lending competition

The interviews revealed that microfinance institutions competed with both formal and informal lenders. Table 6.16 shows some microfinance competitors based on the interviews. Although there are only ten respondents expressing competition in the local market, the researcher believes that competition was experienced by all the sample microfinance institutions. Some banks or financial cooperatives operating near the microfinance institutions could be observed when researcher conducted field trips to the microfinance institutions.

Table 6.16 Lending competition

No	MFI	Competitors
1.	MFI A	Formal (national and rural) banks.
2.	MFI D	Informal lenders, formal (national and rural) banks and government credit program.
3.	MFI F	Formal (national and rural) banks.
4.	MFI G	Formal (national and rural) banks and financial cooperatives.
5.	MFI I	Formal (national and rural) banks.
6.	MFI N	Formal (national and rural) banks and informal lenders.
7.	MFI P	Financial cooperatives and formal (national and rural) banks.
8.	MFI Q	Financial cooperatives and government credit program.
9.	MFI R	Informal lenders.
10.	MFI S	Formal (national and rural) banks.

Respondent of MFI A told of the competition of the microfinance institution with a large rural bank (*Bank Perkreditan Rakyat*) in the village. The microfinance institution cannot compete with the bank to attract savers: as the respondent stated:

Ada kalah dengan itu, di situ kan kalau nabung kan mendapat sepeda motor sama kulkas. Kita ngasih cuma payung doang kan.

We cannot compete with that. The savers can get a motorcycle and refrigerator there. We only give umbrellas to savers.

Difficulties in mobilising public funds cause microfinance capital to grow slower. Some existing successful borrowers who need larger loans will move to competitors. Respondent of MFI N remarked that other banks such as BRI can provide loans with a higher loan ceiling. Respondent of MFI D also described the problem as follows:

Kalau dari kita ya itu, kalahnya di modalnya itu tadi. Karena kita masih modal masih sedikit itu kan. Misalkan ada anggota lancar kok mintanya pinjaman agak besar, otomatis kan kita tidak bisa melayani, akhirnya lari ke yang lain, seperti itu. Jadi kan kita cuman melayani yang istilahnya pinjaman-pinjaman kecil.

We are not competitive in terms of capital. We have small capital. Suppose there are good existing borrowers who ask for bigger loans, we cannot serve. Eventually the borrowers will seek another lender. So we can only serve small loans.

In addition, microfinance also competes with other lenders in terms of interest rates. According to Respondent of MFI D:

Kalau bank-bank swasta sebenarnya lebih tinggi. Apalagi yang sistem kaya bulanan, harian itu...bank-bank harian itu sasarannya ke orang-orang yang butuh mendesak kebanyakan.

Private Banks are actually higher. Especially monthly, daily lending ... daily banks targeted mostly at people who have an urgent need.

Respondent of MFI I also added that:

Kita sebelum menentukan rate bunga, kita melihat kompetitifnya, pesaingnya masih 2,25, 2,5, 2,75, bahkan ada yang 3%. Kita ambil jalan tengah waktu itu. Tengah-tengah.

Before determining the interest rate, we look at the competitors. The competitors are still 2.25, 2.5, 2.75, and some even 3%. We take the average value.

Respondent of MFI P expressed the similar line of argument that:

Dan dia untuk suku bunga sangat tinggi baik tabungan maupun kredit. Karna dia kan kasih suku bunga tinggi otomatis kreditnya kan juga tinggi. Kami ngikuti kreditnya saja. Kalau dia ngasih kredit mungkin 2% ya saya harus berani di bawahnya.

Interest rates are very high for both savings and credit. Because competitors give high interest rates to [savings] automatically the credit is also high. We just follow the credit. If they lend out 2% credit, I have to be below that.

Most microfinance institutions can provide competitive interest rates compared to private banks or informal lenders. Low-cost funding from the PUAP program enables microfinance institutions to reduce lending rates. Microfinance, which relies on funding from public deposit mobilisation, has no choice but to raise interest rates to cover capital costs. Nonetheless, subsidised credits from government programs, such as "Kredit Usaha Rakyat" (KUR) and PNPM, provide lower interest rates than microfinance.

The interviews revealed that the application procedures for microfinance loans are relatively simpler than other banks. The application process does not require complicated surveys and lengthy procedures. In many instances, the applicants are only required to provide a copy of their identity card. A number of respondents described this:

Tidak terlalu ribetlah untuk pencairannya. Kalau di BRI, kan, dicek dulu ke lokasi.

The loan disbursement is not too complicated. In Bank BRI, it needs to be checked to the location. (Respondent of MFI G)

...kita operasinya di segmen grassroot, segmen kecil kan Mas. Misalnya mau minta kredit hanya lima ratus, mau KUR, prosesnya belum tentu satu hari selesai.

...we operate in the grassroots segment, the low income segment. For example, if someone asks for a credit of only five hundred through KUR, the process may not be completed in one day. (Respondent of MFI I)

...kita prosesnya lebih mudah dari BRI sama BKK itu, lebih mudah nggak terlalu dipersulit...

...we make the process easier than BRI and BKK, it is easier and not too complicated ... (Respondent of MFI S)

Nanti kalau terlalu rumit juga dia kadang kan takut kalau ketahuan orang-orang kalau disurvei difoto-foto dianu kan...

If it is too complicated, clients sometimes fear for being seen by other people that they are being surveyed and photographed ... (Respondent of MFI S)

Interviews revealed that loans offered by competitors require collateral. Respondent of MFI S commented that other competitors such as BRI and BKK require collateral for the loans. Respondent of MFI D also stated that:

...kalau jaminan yang semacam kaya Kospin-Kospin itu ada, ada jaminannya semua. Biar pun entah itu BPKB motor, apa itu, tetap ada jaminan. Lah, itu kita kalahnya di--, misalkan ada tunggakan kalahnya di tanpa jaminan itu tadi.

If it is like *Kospin-Kospin*, there is a loan guarantee. They are all collateralised loans. Whether it is *BPKB* motorcycle or others, there must be loan guarantees. That's our weakness, if there are any arrears, we have no collateral.

6.7 Conclusion

Chapter 6 is a qualitative analysis using thematic analysis to understand the existing lending methodology of microfinance institution by exploring the lending practices of both group and individual loans. Analysis data was sourced from interviews conducted on respondents from 20 MFIs in Central Java Province. Semi-structured interviews were conducted face-to-face at each MFI's office. Audio recordings of interviews were then transcribed and thematically analysed with the NVIVO 12 Software.

The thematic analysis revealed that lending methodology is influenced by funding sources of the microfinance. Main findings of the analysis can be summarised as follows:

1. 80% of MFIs are funded by grants from the PUAP government program. Although grants help microfinance to reach poorer people, some respondents expressed concern that many similar government programs have failed.
2. Group lending was only provided by PUAP microfinance. The loans were provided to existing farmer groups under the *Gapoktan*.
3. Most individual lending required collateral except lending from PUAP microfinance. Non-PUAP funded individual lending mitigates the default risks by requiring collateral.
4. The borrower's character was the main factor in borrower selection, especially in PUAP funded microfinance. The respondents related character to a borrower's credit history. Localised operations within a village made it easy for microfinance to find this information. It was obtained from the head of the farmer group, microfinance management, or from local villagers.
5. Borrower selection in group lending relies on peer selection in each farmer group. Joint liability was imposed by peer pressure and group sanctions.
6. Microfinance institutions did not have information about borrower income due to unavailability of the financial information. In addition, a financial information search will be costly for microfinance since it requires skilled personnel as well as budget allocation to collect and process the information.
7. Microfinance lending interest rates were very competitive. The rates were determined by benchmarking on competitor rates. Microfinance that relies for funding on deposit mobilisation charges higher interest rates to cover the cost of funding.
8. Default loans were enforced by a persuasive approach and loan contract renewal. Although some loans are collateralised, microfinance rarely seizes and sells the collateral to cover the default.

CHAPTER 7 QUANTITATIVE ANALYSIS ON RELATIONSHIP BETWEEN DEPTH OF OUTREACH AND SUSTAINABILITY

7.1 Introduction

This chapter presents a quantitative analysis to the research question on the extent of lending methodology effect on the relationship between depth of outreach and sustainability of Indonesian microfinance institutions in Central Java province. The relationship of depth of outreach and sustainability is analysed by comparing two types of lending methodology, individual and group lending. The results will provide evidence on whether or not there is trade-off between depth of outreach and sustainability of microfinance; and how lending methodology may change the outcome. Two main dependent variables of this analysis are interest rates and loan performance. Both variables represent microfinance lending sustainability.

Chapter 7 is structured as followed: Section 7.1 is an introduction to the chapter. Section 7.2 outlines the definitions of the variables. Section 7.3 presents the screening process for the data before it was used in the analysis to obtain valid results of analysis. Section 7.4 presents the results of regression analysis on depth of outreach and interest rates. Section 7.5 presents the results of regression analysis on depth of outreach and loan performance. Section 7.6 presents the results of regression analysis on determinants of loan sizes. Section 7.7 summarises the analysis results of this chapter.

7.2 Variables definitions

There are three types of variable used in the regression analysis, including two dependent variables, two independent variables and eight control variables. The two dependent variables are related to lending sustainability, and include collectability and interest rates. These variables will be regressed with two different regression techniques (Probit regression and Multiple Linear Regression). The two independent variables are related to lending outreach, and include gender and loan amount. The eight control variables consist of loan characteristics and borrower characteristics. The following sections provide definitions of all the variables.

7.2.1 Dependent variables

Two dependent variables will be regressed in the quantitative analysis: loan collectability and interest rates. These variables will be used as indicators of MFI lending sustainability. Adequate revenues from interest and good quality of loan portfolio can help MFIs to have sustainable lending.

Loan collectability (COL) is a binary variable that indicates the loan performance. It is measured by using an individual assessment of each loan by the MFI officer. MFIs were requested to provide loans details that include this collectability assessment. It has three categories of collectability: performing, doubtful and default. To simplify the analysis, the doubtful and default loans are regrouped into one category as non-performing loans. Thus, there will be two categories of loans: performing and non-performing loans. The dummy variable will be equal to 1 if the loan is performing, and 0 otherwise.

Interest rates (IRP) is a continuous variable that represents the expectation of interest revenue earned by MFI per month in percentage. The MFI will receive higher income from charging higher interest rates to borrowers.

7.2.2 Independent variables

Initial loan amount (ILA) is a proxy of borrower income commonly used to measure outreach of microfinance (Bibi et al., 2018; Churchill, 2017; Churchill & Marr, 2017; Gutierrez-Goiria et al., 2017; Mia & Chandran, 2016; Pedrini & Ferri, 2016; Xu et al., 2016). The variable ILA is the amount of loan that has been taken up by a borrower from an MFI at the beginning of the loan period. Many studies used average loan balance rather than loan balance of individual borrowers because those studies analysed the outreach of microfinance at the institutional level. In the present research, the borrower income is proxied by the actual amount of loan size of individual borrowers, which was denominated in the Indonesian Rupiah currency and then was converted into USD using the exchange rate in April 2018 (IDR13,811/USD) based on exchange rate data from the Central Bank spot offer price (source: bi.go.id/sdds/).

Gender (SEX) is the second variable in this research that indicates the depth of outreach of microfinance. It takes a value of 1 if the borrower is a female and otherwise 0. Women are more credit constrained than men (Velasco & Marconi, 2004). Microcredit can empower women and enhance their bargaining power in the household (de Arghion & Morduch, 2005). Therefore, the number of women borrowing in an MFI is commonly used as a measured of depth of outreach (Lafourcade, Isern, Mwangi, & Brown, 2005). Most studies used the proportion of women borrowers in a MFI as an indicator of the depth of outreach (Abdullah & Quayes, 2016; D'Espallier, Guérin, & Mersland, 2011; Dorfleitner et al., 2017). Since the present research is conducted at the individual level, the borrower gender will be used as an indicator of depth of outreach.

7.2.3 Control variables

Lending method (LME) is a dummy variable to show whether a borrower is taking up a group loan (dummy = 1) or individual loan (dummy = 0). Although cost-sensitive, group lending can lower the risk of default (Wenner, 1995). Features in group lending (joint liability, peer selection, and peer monitoring) are considered effective in reducing the likelihood of credit failure. Ghatak and Guinnane (1999) argue that joint liability can overcome adverse selection and moral hazard issues. The present research is interested in comparing the effects of lending method (group and individual) on the relationship between the depth of lending outreach and the lending sustainability.

The loan interest rates and the loan repayment rate, which are used as a measure of MFI loan sustainability, may differ across loan characteristics and borrower characteristics. Microfinance loans have different terms, collateral requirements, different types of installations, and different purposes of use. The borrowers also have differences in terms of education, type of work, length of interaction with MFI, and scope of relationship with MFI. To isolate the effects of those characteristics and to understand the magnitude of microfinance depth of outreach on lending sustainability, those factors will be treated as control variables in the regressions.

Borrower characteristics consists of three dummy variables and one continuous variable. These include education, occupation, length of relationship, and scope of relationship.

- **Education (EDU)** is a dummy variable that indicates the level of borrower education. To simplify the analysis, this variable was transformed from an ordinal variable with several categories into a binary variable that takes a value of 1 if the borrower attained tertiary education, otherwise 0.
- **Occupation (OCC)** is a dummy variable that represents the types of borrower occupation. To simplify the analysis, this variable was transformed from a nominal variable with more than two categories into a binary variable that takes a value of 0 if the borrower is in agricultural sectors, 1 for non-agricultural.
- **Scope of relationship (SCR)** is a dummy variable that represents the savings services provided by MFI and used by a borrower. It takes the value of 1 when a borrower has a savings account in the MFI, and 0 otherwise.
- **Length of relationship (LGR)** is a continuous variable that indicates the duration of lending relationship between a borrower and the associated MFI. It measures the number of loans that are taken up by a borrower from an MFI.

Loan characteristics consists of four dummy variables that include types of instalment, collateral, tenure, and type of loans.

- **Instalment types (INST)** is a dummy variable that indicates repayment schedule of a loan. There are two types of repayment schedule in the sample of MFIs. First, monthly repayment requires a borrower to pay the principal and the interest every month with a flat amount. Second, seasonal repayment requires a borrower to pay the principal and the interest at the end of a planting season. The season can be three or six months depending on the types of crop. The dummy variable will take value of 1 if a borrower is taking a monthly repayment loan, and 0 if a seasonal repayment.
- **Collateral (CLL)** is a dummy variable that indicates a loan is secured with an asset as collateral. Collateralisation can be an effective approach by a lender to secure the repayment of a loan by reducing the problems of asymmetric information in the lending market. This variable takes the value of 1 if a loan is secured with collateral, and 0 otherwise.
- **Tenure (TEN)** is a dummy variable that represents the loan duration and can be grouped into two categories. A short-term loan is a loan that has tenure less than 12 month. A long-term loan is a loan with tenure 12 month or longer. This variable will take the value of 1 if the loan is short-term, and 0 otherwise.
- **Types of loan (LTY)** is a dummy variable that indicates the use the loan. A borrower may utilise the loan either for productive (income generating activities) or for consumption purposes. It is expected that a productive loan can minimise a credit risk as it increases the repayment capacity of the borrower. To simplify the analysis, this variable was transformed from an ordinal variable with several categories into a binary variable that takes value of 1 if a borrower states that the loan is for productive purposes, and 0 otherwise.

7.2.4 Descriptive statistics

Two tables provide a summary of descriptive statistics of the variables. Table 7.1 summarises statistics for the continuous variables, including IRP, LGR and ILA. Table 7.2 summarises ten dummy variables.

Table 7.1 Summary statistics of continuous variable

	IRP		LGR		ILA		
	Statistic	Std. Error	Statistic	Std. Error	Statistic	Std. Error	
Mean	1.9931	0.01228	4.255	0.0893	414.4506	12.89316	
95% Confidence Interval for Mean	Lower Bound	1.9691	4.080		389.1668		
	Upper Bound	2.0172	4.430		439.7344		
5% Trimmed Mean		1.9781	3.646		322.5887		
Median		2.0000	2.000		181.0151		
Variance		0.337	17.845		372030.495		
Std. Deviation		0.58088	4.2243		609.94303		
Minimum		0.50	1.0		10.86		
Maximum		3.50	20.0		7240.61		
Range		3.00	19.0		7229.74		
Interquartile Range		1.00	3.0		344.83		
Skewness		0.280	0.052	2.242	0.052	3.785	0.052
Kurtosis		-0.269	0.103	5.048	0.103	23.536	0.103

Table 7.2 Descriptive statistics of dummy variables

Variable	n	Dummy = 0	Dummy = 1
COL	2238	164 non-performing loans	2074 performing loans
SEX	2238	1390 males	848 females
LEM	2238	1965 group	273 individual
SCR	2238	619 without savings	1619 with savings
EDU	2238	1786 non tertiary	452 tertiary
CLL	2238	1571 uncollateralised	667 collateralised
INST	2238	1021 seasonal	1217 monthly
TEN	2238	1371 long-term	867 short-term
OCC	2238	928 agricultural	1310 non-agricultural
LTY	2238	670 consumption	1568 production

7.3 Data screening

The secondary data was prepared for the regression analysis to ensure a valid statistical analysis. The 2018 cross sectional data collected of MFIs in Central Java province consists of categorical and continuous data. This section consists of 5 sub-sections that evaluate missing data, multicollinearity, outliers, and distribution normality.

7.3.1 Missing Data

Although various attempts were made to obtain complete data during the field trip for data collection, there was always the possibility that data could not be completely obtained. There are several options to overcome the problem of missing data, including removing the cases, imputation with substitution data, and transformation into dummy variables (Gujarati, 2003; Tabachnick & Fidell, 2013; Wooldridge, 2006). For this study,

the method of removing the cases with missing data is the best option as the sample size is quite large (2,276 cases). Missing data transformation or imputation may result in biased estimates (Wooldridge, 2006).

There are three possibilities that arise when case removal is chosen. These three possibilities aim to maximise one of the two following objectives: 1) maximise the number of variables; or 2) maximise the number of cases used. The first involves maximising the number of cases with the consequence of fewer variables in the regression. The second involves maximising the number of variables in the regression with the consequence of losing large number of cases. A third possibility is optimisation of the numbers of both variable and cases.

Table 7.3 shows missing data of all variables and MFIs. The yellow boxes indicate missing data with the corresponding numbers of missing data. Whereas, the green boxes indicate cells without missing data. There are 15 variables, 14 MFIs and a total of 2,276 cases from all MFIs providing the data. Maximisation of the number of cases will reduce the number of variables to 8 (ILA, SEX, IRP, COL, LEM, INST, CLL, and TEN). On the other hand, maximising the number of variables requires elimination of 8 MFIs and leaving 647 cases in the dataset. The third possibility is to removing MFI T and two variables (AGE and INC) leaving 13 MFIs, 2,238 cases and 13 variables in the dataset. The third option was selected since it gives more cases and variables for the analysis.

Table 7.3 Missing data by MFI and variables

MFI	No of Cases	ILA	SEX	IRP	COL	LEM	AGE	EDU	OC	INC	INST	CLL	TEN	LTY	LGR	SCR
MFI I	496									496						
MFI P	360									360						
MFI D	99															
MFI K	22						22									
MFI B	77									77						
MFI E	112						112									
MFI F	52															
MFI O	173															
MFI A	62									62						
MFI G	100															
MFI H	85															
MFI S	412									412						
MFI T	38						38	38	38	38				38	38	38
MFI Q	188															
Total	2276	2276	2276	2276	2276	2276	2104	2238	2238	831	2276	2276	2276	2238	2238	2238

7.3.2 Multicollinearity

Correlation is a relationship between two continuous variables while association is the relationship between one or two categorical variables (Tabachnick & Fidell, 2013). Multicollinearity is characterised by a strong relationship between two independent variables. A correlation coefficient higher than 0.9 is considered to be highly correlated (Tabachnick & Fidell, 2013).

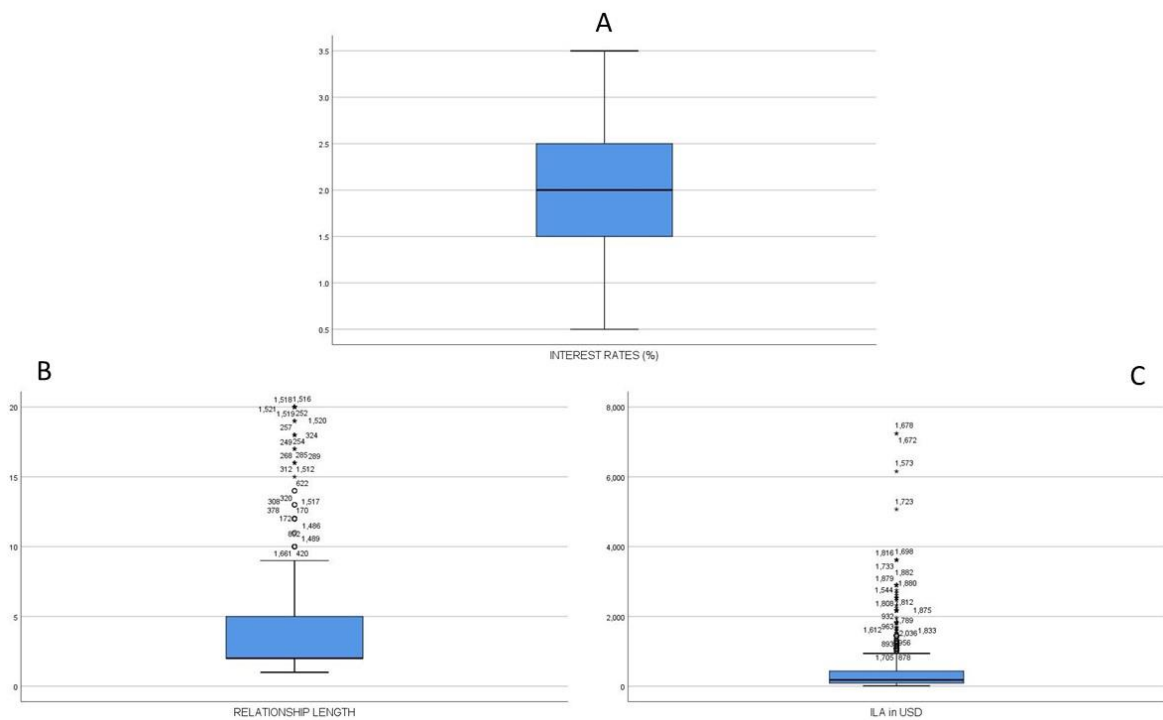
The correlation matrix (see Appendix 7.1) shows the non-existence of excessive high correlation between the independent variables. All correlation values were below 0.9. The two highest correlation values are -0.626 (EDU and LTY) and 0.590 (EDU and CLL). It can be concluded that there is no multicollinearity between the independent variables.

7.3.3 Outliers

An outlier is defined as "...a case with such an extreme value on one variable (a univariate outlier) or such a strange combination of scores on two or more variables (multivariate outlier) that it distorts statistics." (Tabachnick & Fidell, 2013, p. 72). It can cause type I errors (rejection of null hypothesis) and type II errors (non-rejection of false hypothesis), with no clue of which errors an analysis has. In this present research, three continuous variables will be analysed to detect outliers, including interest rate (IRP), initial loan amount (ILA) and length of relationship (LGR).

Figure 7.1 shows a box plot to display the distribution of IRP (Figure A), LGR (Figure B) and ILA (Figure C). The variable IRP is loan interest rate per month in percentage. Figures B and C apparently showed identifiable outliers. These were traced back to the original data sources from the MFIs and it was found that the outliers were not caused by wrong data input to the statistical software.

Figure 7.1 Box plots of IRP, LGR and ILA



The existence of outliers could also be identified from the Z-score of LGR and ILA in Table 7.4. The range of z-scores for both LGR and ILA are considerably large.

Table 7.4 Standardised z-score untransformed continuous variables

	N	Minimum	Maximum	Mean	Std. Deviation
Zscore: INTEREST RATES (%)	2238	-2.57047	2.59409	0.0000000	1.00000000
Zscore: INITIAL LOAN AMOUNT	2238	-0.66168	11.19146	0.0000000	1.00000000
Zscore: RELATIONSHIP LENGTH	2238	-0.77047	3.72731	0.0000000	1.00000000

To minimise the outliers, transformation of ILA and LGR was needed. There are three alternative transformations including the natural logarithm (LOG10), inverse (1/variable), and square-root (Tabachnick & Fidell, 2013). Table 7.5 shows the z-scores of transformed LGR and ILA variables. The inverse of LGR and the natural logarithm of ILA gave the lowest range absolute values.

Table 7.5 Standardised z-score of transformed LGR variable

	N	Minimum	Maximum	Range
LGR:				
Zscore(LGRSQRT)	2238	-1.06454	3.10259	4.16713
Zscore(LGRLG10)	2238	-1.42928	2.43467	3.86395
Zscore(LGRINV)	2238	-1.36941	2.10512	3.47453
ILA:				
Zscore(ILAINV)	2238	-0.91667	9.65832	10.57499
Zscore(ILALOG10)	2238	-2.64108	3.14398	5.78506
Zscore(ILASQRT)	2238	-1.26780	6.20719	7.47499
Valid N (listwise)	2238			

7.3.4 Normality distribution of continuous variables

The next data screening is to check the normality of continuous variable distribution. A not normally distributed continuous variable can cause degradation of the analysis results especially if the variable is severely not normally distributed (Tabachnick & Fidell, 2013). However, “In a large sample, a variable with statistically significant skewness often does not deviate enough from normality to make a substantive difference in the analysis.... In a large sample, the impact of departure from zero kurtosis also diminishes” (Tabachnick & Fidell, 2013, p. 80). Two important statistics to assess normality of distribution are Skewness and Kurtosis. These statistics are zero if the data is normally distributed.

Table 7.6 shows the Skewness and Kurtosis statistics of three continuous variables. All three variables are positive but close to zero. The right tails of these variable distributions are rather longer than the left tails, positively skewed. On the other hand, Kurtosis of IRP and ILALOG are negative, which indicates the distribution of these variables is rather flat. Meanwhile, the Kurtosis statistic of LGRINV is positive indicating that the distribution of LGRINV is rather peaked with short tails.

Table 7.6 Skewness and Kurtosis

	Skewness	Kurtosis
IRP	0.280	-0.269
LGRINV	0.822	0.074
ILALOG	0.359	-0.371

7.4 Relationship between depth of outreach and interest rates in individual and group lending

To investigate whether the depth of outreach is reflected in the loan interest rates, the dependent variable of interest rates (IRP) is introduced in this analysis. Other study such as Nwachukwu et al. (2018) used nominal yield portfolio (YLD) as a proxy for loan interest rates to examine determinants of interest rates including microfinance age, lending scale, and organisation charter. Unlike Nwachukwu et al. (2018), this study uses the actual interest rates that microfinance charges borrowers. To isolate the effects of borrower and other loan characteristics, eight control variables were added to the regression model.

To test hypotheses on the relationship between interest rates and depth of outreach, a standard OLS multiple regression method is applied. The following hypotheses 1 to 4 will be tested:

H1: Loan size (ILA) in individual lending is correlated with the interest rates (IRP)

H2: Loan size (ILA) in group lending is correlated with the interest rates (IRP)

H3: Gender (SEX) in individual lending is associated with interest rates (IRP)

H4: Gender (SEX) in group lending is associated with interest rates (IRP)

The outcomes of the regression OLS estimation is presented in Table 7.7. The regression shows sign, size, and significance of the variables coefficients (B). The independent variables were hierarchical, added to the equation starting from column 6 to column 1. Adjusted R^2 and F-statistics are used to measure the regression goodness of fit that was identified using Ordinary Least Square (OLS) estimation (Tabachnick & Fidell, 2013). The regression in column 1 shows the highest Adjusted R^2 is 0.292 which means that 29.2% of the interest rate (IRP) variation is explained by the predictor variables. The model validity is measured by the F-statistics (Hair et al., 2014). The output shows that the F-statistics in models 1 to 6 are statistically significant at 1% level, confirming the significance of the overall model.

The addition of variables gender (SEX) and loan size (ILALOG) increase the R^2 by 0.001 and 0.024 respectively. The inclusion of the lending methodology variable (LME) and two interaction variables, LME-SEX and LME_ILALOG, increase R^2 by 0.005 and 0.001. The biggest change of R^2 of 0.196 is from the addition of control variables related to borrower characteristics. The addition of four loan characteristic variables increases the R^2 by only 0.069.

Table 7.7 The output of hierarchical interest rates (IRP) regression

	1	2	3	4	5	6
	B (S.E.)	B (S.E.)	B (S.E.)	B (S.E.)	B (S.E.)	B (S.E.)
(Constant)	2.291*** (0.089)	1.687*** (0.072)	2.533*** (0.068)	2.501*** (0.066)	2.411*** (0.059)	1.982*** (0.016)
SEX	0.126*** (0.024)	0.087*** (0.024)	0.019 (0.026)	0.027 (0.025)	0.037 (0.025)	0.029 (0.025)
ILALOG	-0.066** (0.032)	0.045 (0.029)	- 0.228*** (0.028)	-0.216*** (0.027)	-0.186*** (0.025)	
LME	-0.425** (0.188)	-0.302 (0.185)	-0.419** (0.199)	-0.129*** (0.040)		
LME_ILALOG	0.100 (0.096)	0.144 (0.097)	0.145 (0.104)			
LME_SEX	0.024 (0.079)	-0.002 (0.082)	0.060 (0.091)			
EDU	-0.692*** (0.037)	- 0.678*** (0.034)				
OCC	0.067** (0.027)	-0.027 (0.027)				
LGR	0.219*** (0.041)	0.147*** (0.042)				
SCR	0.249*** (0.033)	0.364*** (0.026)				
INST	-0.379*** (0.029)					
CLL1	0.085** (0.035)					
TEN	-0.242*** (0.030)					
LTY	-0.123*** (0.037)					
No. of Obs.	2,238	2,238	2,238	2,238	2,238	2,238
Fstat	71.938	72.533	14.141	22.607	28.561	1.346
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Adj-R ²	0.292	0.223	0.029	0.028	0.024	0.000
R ²	0.296	0.227	0.031	0.029	0.025	0.001
R ² change	0.069***	0.196***	0.001	0.005***	0.024***	0.001

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

Based on the results in Table 7.8 column 1, the negative and significant coefficient of variable LME indicates that borrowers in group lending pay lower interest rates by 0.425% than borrowers in individual lending. This confirms the theoretical prediction of Zhao and Gao (2011) and data from Zimbabwe of (Bratton, 1986). Assortative matching may reduce the monitoring costs reflected in interest rates.

The negative and significant coefficient of variable ILALOG indicates that loan size in individual lending is inversely correlated with interest rates. The significant coefficient

confirms Hypothesis H1 that loan size (ILA) in individual lending is correlated with the interest rates (IRP). A 1% decrease of the loan size would increase interest rates by 0.066%. This suggests that the borrowers with lower income pay higher interest rates than borrowers with bigger income.

The positive but insignificant coefficient of variable LME_ILALOG indicates that there is no significant relationship between loan size and interest rates in group lending. This finding does not confirm Hypothesis H2 that loan size (ILA) in group lending is correlated with the interest rates (IRP). The effects of loan sizes on interest rates may be cancelled out by the group lending. Smaller loan sizes are charged higher interest rates but at the same time the interest rates in the group lending are lower than in the individual lending.

The positive and significant coefficient of the gender dummy (SEX) indicates that female borrowers in individual lending pay higher interest rates by 0.126% than male borrowers. The difference does not necessarily mean discrimination against female borrowers since it is identifiable and can cause a costly implication to lenders (Cavalluzzo et al., 2002). This finding is in line with the finding of Dorfleitner et al. (2013) and provides evidence to confirm Hypothesis 3 that gender (SEX) in individual lending is associated with interest rates (IRP).

The positive but insignificant coefficient of variable LME_SEX indicates that there is no significant difference of loan interest rates between female borrowers and male borrowers in group lending. This finding does not confirm Hypothesis 4 that Gender (SEX) in group lending is associated with interest rates (IRP). The effects of gender on interest rates may be cancelled in the group lending. Female borrowers pay higher interest rates than men in the individual lending but at the same time the interest rates in the group lending are lower than in the individual lending.

Seven out of the 8 control variables are significant determinants of loan interest rates at least at 5% significance level. Table 7.8 shows the interpretation of regression results for all significant control variables. Three variables related to borrower characteristics, including education, scope of relationship and length of relationship, are significant to influence loan interest rates of microfinance. Four variables related to loan characteristics, including instalment types, collateral, tenure, and loan purpose, are also significant to influence interest rates.

Table 7.8 Control variables interpretation

Control Variables	Coefficients	Interpretation
EDU	-0,692***	Borrowers with tertiary education pay 0.692% lower interest rates than borrowers with a lower education level.
LGR	0,219***	Borrowers having a longer relationship with the microfinance institution pay 0.219% higher interest rates than those having a shorter relationship. The length of relationship is defined by the number of loans that a borrower has taken from the corresponding microfinance institution.
SCR	0,249***	Borrowers possessing a savings account in the microfinance pay 0.249% higher interest rates than those who do not possess a savings account.
INST	-0,379***	Loans with monthly repayment are charged 0.379% lower interest rates than loans with seasonal repayment.
CLL1	0,085**	Loans guaranteed by collateral pay 0.085% higher interest rates than uncollateralised loans.
TEN	-0,242***	Short-term loans (less than 12 months) are charged 0.242% lower interest rates than long term loans.
LTY	-0,123***	Loans for productive purpose are charged 0.123% lower interest rates than consumptive loans.

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

In addition, a supplementary analysis was performed to check the robustness of the model by separating the full sample into group and individual lending subsamples. Accordingly, this method may detect the possibility that the gender and loan size effects on interest rates are due to lending methodology differences. Table 7.9 presents the estimation output from each of the subsamples respectively.

The model of individual lending and group lending explained 30.8% and 80.2% respectively of the variation of the interest rates variable (IRP). F-statistics for both individual and group lending models (88.464 and 111.159 respectively) are statistically significant at 1% level, indicating the models with all the independent variables fit the data better than a model with the intercept only. The adjusted-R² of the group lending model is 0.802, implying that 80.2% of IRP variation is explained by the model. This is higher than the adjusted R² of individual lending that explains only 30.8% the IRP variation. Overall, assessment on the goodness of fit shows that both models may provide good prediction on the interest rates.

Table 7.9 Interest rates regressions: by lending methodology

	Individual lending		Group lending	
	B	S.E.	B	S.E.
(Constant)	2.383***	0.095	2.186***	0.084
SEX	0.135***	0.025	0.012	0.019
ILALOG	-0.075**	0.033	-0.038	0.026
Control variables:				
EDU	-0.740***	0.040	0.152***	0.036
OCC	0.075**	0.029	-0.248***	0.021
LGR	0.232***	0.044	-0.344***	0.057
SCR	0.210***	0.038	-0.078**	0.031
INST	-0.402***	0.031	-0.033	0.025
CLL1	0.098**	0.038	0.169***	0.041
TEN	-0.282***	0.032	0.655***	0.033
LTY	-0.155***	0.040	0.005	0.049
No. of Obs.	1,965		273	
Fstat	88.464		111.159	
Prob > F	0.000		0.000	
Adj-R ²	0.308		0.802	
R ²	0.312		0.809	

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

Variable gender (SEX) and loan size (ILALOG) are only statistically significant in individual lending. There is no evidence that loan size and gender in group lending has significant association with interest rates (IRP). The positive and significant coefficient of variable SEX indicates that gender in individual lending has a statistically significant association with loan interest rates; and female borrowers in individual lending pay 0.135% higher interest rates than male borrowers, holding all other independent variables constant. The negative and significant coefficient of variable ILALOG in the individual lending model indicates that loan size in individual lending has statistically significant correlation with loan interest rates; and larger loan sizes in individual lending are correlated with lower interest rates. For every 1% increase in loan size, the loan interest rate decreases by 0.075%, holding all other independent variables constant.

There are some differences in the coefficient of the control variables between individual lending and group lending. Instalment type (INST) and loan type (LTY) are important factors of IRP in individual lending but have no significant effects on IRP in group lending. The sign of other independent variables such as OCC and SCR are also different. For individual lending, borrowers working in non-agricultural sectors pay 0.075% higher interest rates than those who are working in agricultural sectors. Whereas borrowers in group lending and working in non-agricultural sectors pay 0.075% higher interest rates than those who are working in agricultural sectors. Meanwhile, the coefficients of

collateral (CLL) stays stable in both models. Collateralised loans are charged with higher interest rates in both individual and group lending.

7.5 Relationship between depth of outreach and loan collectability

This section investigates empirically if depth of outreach has effects on the performance of loans. Two categories for the loan status are applied: “performing” and “non-performing”. Loans featuring a delay in instalment payment of less than 30 days are considered “performing”, while loans with a delay in instalment payment of at least 30 days are considered “non-performing”. Adapting the study of Alam et al. (2019), the response variable is a binary dummy variable of COL which is equal to 1 if the loan status is performing and otherwise 0. To isolate the effects of borrower and other loan characteristics, eight control variables are added to the regression model.

To test hypotheses on the relationship between loan collectability and depth of outreach, logistic regression method is applied. The following hypotheses 5 to 8 will be tested:

H5: Loan size (ILA) in individual lending is associated with the likelihood of loan collectability (COL)

H6: Loan size (ILA) in group lending is associated with the likelihood of loan collectability (COL)

H7: Gender (SEX) in individual lending is associated with the likelihood of loan collectability (COL)

H8: Gender (SEX) in group lending is associated with the likelihood of loan collectability (COL)

The outcomes of the logistic regression estimation are presented in Table 7.10. The regression shows sign, size, and significance of the variables coefficient or the odds ratio (B). A positive value of the odds ratio means a greater likelihood of performing loan status. Whereas, a negative value of the odds ratio means a smaller likelihood of performing loan status. The independent variables were added gradually from column 6 to column 1.

The regression goodness of fit is assessed by four indicators including % of prediction, Hosmer–Lemeshow test statistics, Nagelkerke R^2 , and Omnibus test statistics. All the models predicted correctly at least 89.9% of the observed values. The chi-square of the Hosmer–Lemeshow test for models 1, 3 and 4 is statistically significant with a p-value less than 5%. This result indicates that predicted likelihood may deviate from the observed likelihood, implying that the model does not predict. A better model with p-

value greater than 5% are the models in columns 2 and 5. The regression output also provides the highest Nagelkerke R^2 in column 1 of 0.255. This means that 25.5% of the loan collectability (COL) variation is explained by the predictor variables in the model. The other specifications in columns 2 to 6 predicted 90.2% the outcome correctly. Furthermore, the chi-square for omnibus test for models 1 to 6 are significant at 1% level. The results imply that the estimated models outperform the model containing only the intercepts. Overall, assessment on the goodness of fit shows that model 2 may provide better prediction on the loan collectability since it has better Nagelkerke R^2 and Hosmer–Lemeshow tests.

Table 7.10 The output of loan collectability regression

	1	2	3	4	5	6
	B (S.E.)	B (S.E.)	B (S.E.)	B (S.E.)	B (S.E.)	B (S.E.)
SEX(1)	-0.529*** (0.186)	-0.828*** (0.175)	-0.678*** (0.165)	-0.584*** (0.159)	-0.563*** (0.158)	-0.504*** (0.157)
LME(1)	-4.116** (1.938)	-2.171 (1.779)	-4.162*** (1.530)	-1.214*** (0.299)	-0.869*** (0.286)	
ILALOG	1.405*** (0.266)	0.397* (0.205)	0.729*** (0.172)	0.645*** (0.166)		
LME_ILALOG	-1.498 (0.958)	-0.361 (0.890)	-1.399* (0.775)			
LME_SEX(1)	0.682 (0.657)	1.181* (0.617)	1.350** (0.616)			
Control variables:						
EDU(1)	-1.886*** (0.357)	-1.620*** (0.347)				
OCC(1)	-0.046 (0.178)	0.246 (0.166)				
LGR	-1.046*** (0.275)	-1.779*** (0.255)				
SCR(1)	-0.957*** (0.309)	-0.458*** (0.162)				
INST(1)	1.480*** (0.238)					
CLL1(1)	0.892*** (0.332)					
TEN(1)	-1.211*** (0.233)					
LTY(1)	-0.026 (0.232)					
Constant	5.155** (2.010)	5.081*** (1.821)	3.708** (1.632)	2.235*** (0.423)	3.385*** (0.307)	2.557*** (0.133)
No. of obs.	2,238	2,238	2,238	2,238	2,238	2,238
% correct prediction	89.9	90.2	90.2	90.2	90.2	90.2
Hosmer– Lemeshow test	24.489***	14.974*	17.858**	20.970***	0.256	-
Nagelkerke R2	0.255	0.134	0.044	0.036	0.021	0.010
Omnibus test	287.318***	146.897***	47.055***	38.079***	22.315***	10.392***

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

Referring to Table 7.10, column 2, it shows a negative but not significant coefficient of variable LME, indicating that lending methodology is not statistically associated with loan performance. The positive and significant coefficient of variable ILALOG indicates that loan size in individual lending is correlated with loan collectability; and larger loan sizes in individual lending are associated with higher likelihood of a performing loan. The estimated coefficients are the log odds of dependent variables that show relationship between independent variables and dependent variable (Logistic regression SPSS

annotated output, n.d.). Exponentiating the coefficients or the log odds ratios gives the odd ratios. In this case, the log odds loan collectability is 0.397. The exponentiating of this log odd gives the odd ratio which is 1.487. This number can be interpreted that 1 unit increase of ILALOG is expected to rise the log odds of loan collectability by 0.487 or 1.487 times, holding all other independent variables constant. These results confirm Hypothesis H5 that loan size (ILA) in individual lending is associated with the likelihood of loan collectability (COL). The negative but insignificant coefficient of interaction variable LME_ILALOG indicates that loan size in group lending is not correlated with loan collectability. This result cannot confirm Hypothesis H6 that loan size (ILA) in group lending is associated with the likelihood of loan collectability (COL).

The negative and significant coefficient of variable SEX indicates that gender in individual lending is significantly associated with loan collectability; and female borrowers in individual lending are associated with the lower likelihood of a performing loan. The coefficient of SEX indicates that loans given to female borrowers in individual lending decrease the log odds of a performing loan by 0.828 times or the odds of a performing loan by 0.437 times, holding all other independent variables constant. These results confirm Hypothesis H7 that gender (SEX) in individual lending is associated with the likelihood of loan collectability (COL). It is also in line with Adanu and Boateng (2015), who found likelihood of default for male borrowers is higher than females based on data from microfinance in Ghana. Alam et al. (2019) also found that female borrowers default rates are slightly lower than male borrowers from data of Canadian microfinance with an individual lending methodology.

The coefficient of Interaction variable of LME_SEX is positive and significant at 10% level. Although this indicates that gender in group lending is associated with loan collectability, the relationship is not quite strong. There is not enough strong evidence to confirm Hypothesis H8 that gender (SEX) in group lending is associated with the likelihood of loan collectability (COL). This conclusion is supported by the regression result in Table 7.12 that split the data into two, individual loans and group loans. The results show that the variable ILALOG and SEX are not significant.

Six control variables are significant determinants of loan collectability at 1% significance level. Table 7.11 shows the interpretation of regression results for all significant control variables. Three variables related to borrower characteristics, including education, scope of relationship and length of relationship are significant to influence loan collectability. Three variables related to loan characteristics, including instalment types, collateral, and tenure, are also significant to loan collectability.

Table 7.11 Control variables interpretation

Control Variables	B	Interpretation
EDU	- 1.620***	Loans given to borrowers with tertiary education decrease the log odds of a performing loan by 1.620 times.
LGR	- 1.779***	1 unit increase of the relationship length with the microfinance institution decreases the log odds of a performing loan by 1.779 times. The length of relationship is defined by the number of loans that a borrower has taken from the corresponding microfinance institution.
SCR	- 0.458***	Loans given to borrowers possessing saving account in the microfinance decrease the log odds of performing loan by 0.458 times the odds of those who do not possess saving account.

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

In addition, additional analyses were performed to check the robustness of the model in Table 7.12, column 2 by separating the full sample into group and individual lending subsamples. Accordingly, this method may rule out the possibility that the loan size effect on loan collectability is due to lending methodology. Table 7.12 presents the estimation output from each subsample respectively.

The model of individual lending and group lending predicted correctly 89.6% and 95.6% of the observed values respectively. The chi-square of the Hosmer–Lemeshow test for individual lending model is statistically significant with a p-value higher than 5%. This result indicates that predicted likelihood may not deviate largely from the observed likelihood, implying that the individual model does predict. Similarly, the chi-square of the Hosmer–Lemeshow test for the group lending model is not statistically significant. This result indicates that predicted likelihood may not deviate largely from the observed likelihood, implying that the group lending model does predict. The regression also provides Nagelkerke R^2 for individual lending and group lending, 12.0% and 47.8% respectively. This implies that the loan collectability (COL) variation is explained by the predictor variables in both models of at least 12.0%. Furthermore, the chi-square for the omnibus test for both models is significant at 1% level. The results imply that the estimated models outperform the models containing only the intercepts. Overall, assessment on the goodness of fit shows that both models may provide good prediction on the loan collectability.

Table 7.12 The output of loan collectability regression: individual and group lending

	Individual lending		Group lending	
	B	S.E	B	S.E
SEX(1)	-0.778***	0.175	-0.640	0.742
ILALOG	0.339*	0.203	1.658	1.278
Control variables:				
EDU(1)	-1.672***	0.360	2.637	1.652
OCC(1)	0.088	0.170	3.396***	0.946
LGR	-1.641***	0.262	-0.892	1.368
SCR(1)	-0.431**	0.167	-3.691**	1.703
Constant	4.217***	0.670	-0.670	2.926
No. of obs.	2,238		2,238	
% correct prediction	89.6		95.6	
Hosmer–Lemeshow test	15.159*		6.392	
Nagelkerke R2	0.120		0.478	
Omnibus test	118.685***		47.275***	

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

Variable gender (SEX) and loan size (ILALOG) are only statistically significant in individual lending. The negative and significant coefficient of variable SEX indicates that gender in individual lending is significantly associated with loan collectability; and female borrowers in individual lending are associated with lower likelihood of performing loan. The coefficient of SEX indicates that loans given to female borrowers in individual lending decrease the log odds of a performing loan by 0.778 times or the odds of a performing loan by 0.459 times, holding all other independent variables constant.

The positive and significant coefficient of variable ILALOG in individual lending model indicates that loan size in individual lending is correlated with loan collectability, and larger loan sizes in individual lending are associated with higher likelihood of a performing loan. For every 1% increase in loan size, the log odds of a performing loan increases 0.339 times or the odds of a performing loan increase 1.404 times, holding all other independent variables constant.

7.6 Loan size determinants

To investigate whether loan size is reflected by gender, lending methodology and borrower income, the dependent variable of loan size (ILALOAG) is introduced in this analysis. The loan size is measured by the amount disbursed. To test hypotheses on the relationship between loan size and the three variables of interest, a hierarchical standard OLS multiple regression method is applied. The following hypotheses 9 to 10 will be tested:

H9: Lending method (LME) is associated with loan size (ILA)

H10: Gender (SEX) is associated with loan size (ILA)

The results summary of regression OLS estimation is presented in Table 7.13. There are 4 columns that represent 4 groups of variables hierarchically added to the model. The regression starts with the two variables of main interest, including gender and lending method. An interaction variable of LME-SEX was added into regression in column 3. Regression in column 2 added 4 control variables related to borrower characteristics. Lastly, another four control variables related to loan characteristics were added to regression in column 1. The summary also shows sign, size, and significance of the variables coefficients (B). Adjusted R^2 and F-statistics were used to measure the regression goodness of fit that was identified using Ordinary Least Square (OLS) estimation (Tabachnick & Fidell, 2013). The model validity is measured by the F-statistics (J. F. Hair et al., 2014).

The results in column 1 to 4 show the statistically significant value of F-statistics at 1% level confirming the significance of the overall model in all four specifications. The highest adjusted R^2 is specified in column 1 as all variables were included. The predictor variables in the model explain 51.3% variation of loan size (ILALOG). The R^2 change in column 1 is 0.127, indicating that lending method and gender explained 12.7% of the variation of loan size. The addition of the interaction variable LME_SEX into regression in column 3 is statistically significant but only slightly increases the R^2 by 0.004. The variable can only explain 0.4% of the loan size variation. The addition of borrower characteristics variables significantly changes R^2 by 23.4%. Lastly, the addition of loan characteristics variables in column 1 significantly increases the R^2 by 0.151.

Table 7.13 The output of loan size (ILALOG) regression

	1		2		3		4	
	B	s.e.	B	s.e.	B	s.e.	B	s.e.
(Constant)	2.179***	0.039	2.196***	0.026	2.400***	0.013	2.392***	0.013
SEX	-0.008	0.017	-	0.018	-0.024	0.021	-0.005	0.020
LME	-	0.032	-	0.030	-	0.034	-	0.030
LME_SEX	0.435***	0.054	0.436***	0.061	0.582***	0.071	0.533***	
Control variables:								
EDU	0.379***	0.024	0.519***	0.023				
OCC	0.149***	0.019	0.126***	0.020				
LGR	0.082***	0.028	0.116***	0.031				
SCR	-	0.022	-0.015	0.020				
INST	-0.043**	0.020						
CLL1	0.354***	0.023						
TEN	-	0.019						
LTY	0.378***	0.026						
No. of Obs.	2,238		2,238		2,238		2,238	
Fstat	215.457		183.221		112.120		162.852	
Prob > F	0.000		0.000		0.000		0.000	
Adj-R ²	0.513		0.363		0.130		0.126	
R ²	0.516		0.365		0.131		0.127	
R ² changes	0.151***		0.234***		0.004***		-	

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

Referring to Table 7.13, column 1, the negative and significant coefficient of variable LME indicates that borrowers in group lending receive smaller loan sizes by 0.435 dollars than borrowers in individual lending. This confirms hypothesis H9 that lending method (LME) is associated with loan size (ILA). This result may imply that group lending borrowers have lower income than individual lending borrowers.

The coefficient of the gender dummy (SEX) is not significant, which indicates that gender is not statistically associated with loan size. This finding does not confirm Hypothesis 10 that gender (SEX) is associated with loan size (ILA). The interaction variable of LME_SEX is also not significant, indicating that there is no significant difference of loan size between female borrowers and male borrowers in group lending.

All eight control variables are significant determinants of loan collectability at 1% significance level. Table 7.14 shows the interpretation of regression results for all significant control variables. Three variables related to borrower characteristics, including education, scope of relationship and length of relationship, are significant to

influence loan collectability. Three variables related to loan characteristics, including instalment types, collateral, and tenure, are also significant to loan collectability.

Table 7.14 Control variables interpretation of loan size regression

Control Variables	Coefficients	Interpretation
EDU	0.379***	Borrowers with tertiary education receive 0.379 dollars bigger loan size than borrowers with lower education level.
OCC	0.149***	Borrowers working in non-agricultural sectors receive 0.149 dollars bigger loan size than borrowers working in agricultural sectors.
LGR	0.082***	Borrowers having a longer relationship with the microfinance institution receive 0.082 dollars bigger loan size than those having a shorter relationship. The length of relationship is defined by the number of loans that a borrower has taken from the corresponding microfinance.
SCR	-0.180***	Borrowers possessing a savings account in the microfinance institution receive 0.180 dollars smaller loan size than those who do not possess a savings account
INST	-0.043**	Loans with monthly repayment have 0.043 dollars lower loan size than loans with seasonal repayment.
CLL1	0.354***	Loans guaranteed by collateral have 0.354 bigger loan size than uncollateralised loans
TEN	-0.378***	Short-term loans (less than 12 months) have 0.378 smaller loan size than long term loans.
LTY	0.140***	Loans for productive purpose have 0.140 dollars bigger loan size than consumptive loans.

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

In addition, a supplementary analysis was performed to check the robustness of the model by separating the full sample into group and individual lending subsamples. Accordingly, this method may rule out the possibility that the lending method effect on loan size detected in the previous section is due to gender. Table 7.15 present the estimation output from each subsample respectively. The first check was performed by splitting the whole sample into individual and group lending subsamples. Both models are significant at 1% level with F-statistics of 183.548 and 34.569 respectively. The parameters of adjusted R² imply that variation of loan size in individual and group lending are explained by independent variables for 45.5% and 52.6% respectively. The gender variable (SEX) is not statistically significant in both specifications. The second check was performed by splitting the whole sample into male and female subsamples. Both models are significant at 1% level with F-statistics of 183.548 and 34.569 respectively. The parameters of adjusted R² imply that variations of loan size in male and female borrowers

are explained by independent variables for 51.5% and 53.6% respectively. The lending methodology variable (LME) is negative and statistically significant in both specifications. This implies that lending method is associated with loan size. For males, loan size in group lending is 0.427 dollars smaller than loan size in individual lending. For females, loan size in group lending is 0.260 dollars smaller than loan size in individual lending. On average, the results show that loan size gap between group lending and individual lending is larger for males than for females.

Table 7.15 The output of loan size regression by subsamples of gender and lending methodology

	Lending methodology				Gender			
	Individual lending		Group lending		Male		Female	
	B	Std. Error	B	Std. Error	Beta	Std. Error	Beta	Std. Error
(Constant)	2.180***	0.041	2.180***	0.041	2.199***	0.050	2.191***	0.063
SEX	-0.006	0.017	-0.006	0.017				
LME					-	0.036	-	0.050
					0.427***		0.260***	
EDU	0.384***	0.025	0.384***	0.025	0.382***	0.031	0.338***	0.040
OCC	0.140***	0.020	0.140***	0.020	0.167***	0.023	0.091***	0.030
LGR	0.039	0.030	0.039	0.030	0.121***	0.034	-0.051	0.051
SCR	-	0.025	-	0.025	-	0.029	-0.069**	0.033
	0.112***		0.112***		0.238***			
INST	-0.032	0.021	-0.032	0.021	-0.032	0.026	-0.043	0.030
CLL1	0.302***	0.025	0.302***	0.025	0.336***	0.032	0.384***	0.032
TEN	-	0.020	-	0.020	-	0.024	-	0.031
	0.401***		0.401***		0.349***		0.409***	
LTY	0.150***	0.027	0.150***	0.027	0.129***	0.031	0.161***	0.044
No. of Obs.	1,965		273		1,390		848	
Fstat	183.548		34.569		164.976		109.717	
Prob > F	0.000		0.000		0.000		0.000	
Adj-R ²	0.455		0.526		0.515		0.536	
R ²	0.458		0.542		0.518		0.541	

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

7.6.1 Relationship between borrower income and loan size

Analysis of relationship between income and loan amount was performed separately in this section for the reason of data availability. The ILA variable has a greater number of observations than the INC variable. There are 1,407 missing data units in the INC variable since borrower monthly income is rarely recorded by the microfinance institutions. Loan size (ILA) will be used as a proxy for borrower's monthly income in the present research. For this purpose, the relationship between income and loan size needs to be examined and the following hypothesis will be tested:

H11: Borrower income (INC) is correlated with loan size (ILA)

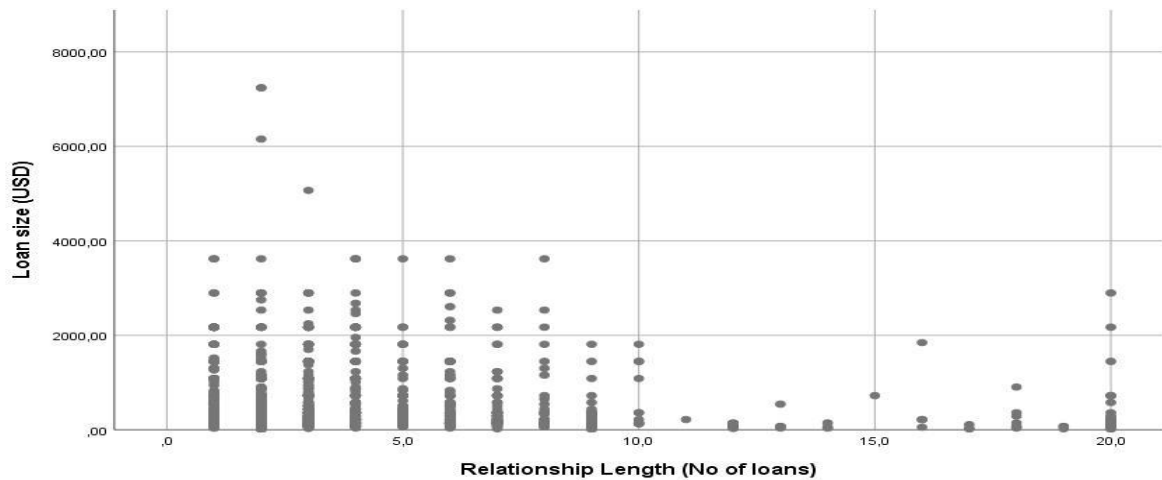
Many studies have used loan amounts as a proxy for income (Schreiner, 2002). Table 7.16 shows empirical studies that have used loan size as the proxy for the depth of outreach or poverty level of borrowers.

Table 7.16 List of studies using loan size as proxy of income or poverty level

No	Reference	Proxy for poverty level or income
1.	Miyashita (2000)	Average loan size to GDP per capita
2.	Cull et al. (2007)	Average loan size to GNP per capita
3.	Cull et al. (2009)	Average loan size
4.	Gutierrez-Nieto et al. (2009)	Average loan balance per borrower to GNI per capita
5.	Hermes et al. (2011)	Average loan balance per borrower
6.	Quayes (2012)	Average Loan Balance per borrower divided to GNI per capita
7.	Louis and Baesens (2013)	Average loan size per borrower to GDP per capita
8.	Roberts (2013)	Average loan size
9.	Vanroose and D'Espallier (2013)	Average loan size per borrower to GDP per capita
10.	Abate et al. (2014)	Average loan size
11.	Quayes and Khalily (2014)	Average loan balance per borrower
12.	Brière and Szafarz (2015)	Average loan size
13.	Quayes (2015)	Average loan balance to GNI per capita
14.	Widiarto and Emrouznejad (2015)	Average loan balance per borrower to GNI per capita
15.	Mahinda Wijesiri et al. (2015)	Average loan balance
16.	Lebovics et al. (2016)	Average loan size
17.	Churchill (2017)	Average loan size
18.	Sheremenko et al. (2017)	Average loan amount per borrower
19.	Widiarto et al. (2017)	Average loan balance
20.	Abrar (2019)	Average loan size

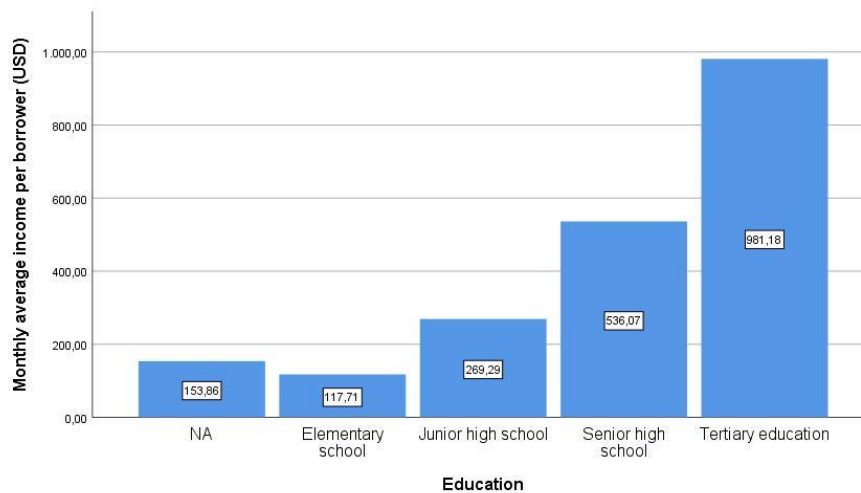
Loan size is not positively associated with the number of loans. This implies that loan size does not increase with repeat loans (Bibi et al., 2018; Godquin, 2004). Figure 7.2 depicts the scatter plots of loan size and relationship length. The length of relationship indicates how many loans a borrower has taken out from an MFI. For example, the loan size of a borrower with their 20th loan in an MFI is not always bigger than the loan size of a borrower with a first loan.

Figure 7.2 Loan size and relationship length



Borrowers with higher education levels tend to have higher income. Figure 7.3 shows monthly average income of borrowers with different education level. The average income of a borrower with tertiary education is higher than the borrower with lower education.

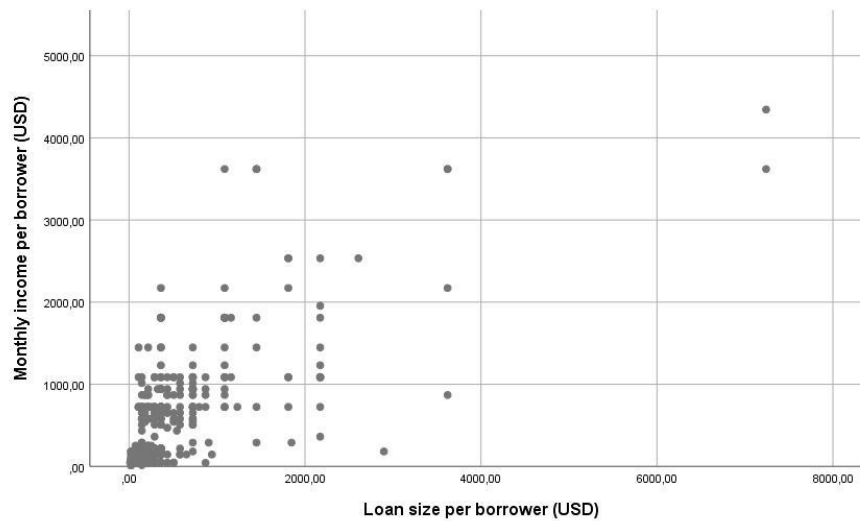
Figure 7.3 Monthly income and borrower education level



Note: Loan size (ILA) is used as a proxy for borrower's monthly income

The Pearson correlation statistics show income is strongly and positively correlated to loan amount (0.742). This correlation is statistically significant at 5% level of significance. Higher income borrowers are associated with bigger loan size. This can also be shown in Figure 7.4, where higher incomes tends to have bigger loans.

Figure 7.4 Loan size and borrower income



To further examine whether the loan size reflects the income of borrowers, the same dependent variable of loan size (ILALOG) is reintroduced in this analysis. Unlike the previous studies that used average loan balance per borrower, the present analysis uses exact loan size that borrowers received from the microfinance institution. To isolate the effects of borrower and other loan characteristics, eight control variables are added to the regression model.

A hierarchical multiple linear regression is used to examine the relationship between income (INC) and loan size (ILALOG) by adding independent variables in an order (see Table 7.17). Column 3 was found to be statistically significant at 1% level with F-stat of 660.71. The variable INC was statistically significant at 1% level with marginal effect of 0.001. The variable explained 0.444 of the variation of loan size. Four control variables related to borrower characteristics were added to Column 2. The output shows that Column 2 is significant at 1% level with F-stat of 209.73. The addition of variables explained 0.116 of loan size variation. The variable INC in Model 2 is significant at 1% level but the marginal effect decreases to almost zero. Adding another four control variables related to loan characteristics into Column 3 did not improve R^2 significantly. The variables explained 0.038 of loan size. The variable INC is still significant at 1% with marginal difference of 0.000.

Table 7.17 Hierarchical loan size regression

	1		2		3	
	B	s.e.	B	s.e.	B	s.e.
(Constant)	1.927***	0.075	2.045***	0.029	1.975***	0.014
INC	0.000***	0.000	0.000***	0.000	0.001***	0.000
Control variables:						
EDU	0.060	0.050	0.022	0.048		
OCC	0.208***	0.028	0.215***	0.027		
LGR	0.017	0.045	0.023	0.044		
SCR	-0.273***	0.027	-0.206***	0.027		
INST	0.099***	0.034				
CLL1	0.182***	0.041				
TEN	0.060	0.037				
LTY	0.051	0.067				
No. of Obs.	831		831		831	
Fstat	135.64***		209.73***		660.71***	
Prob > F	0.000		0.000		0.000	
Adj-R ²	0.593		0.557		0.443	
R ²	0.598		0.560		0.444	
R ² changes	0.038***		0.116***		0.444***	
Prob. Changes	0.000		0.000		0.000	

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

In addition, a robustness check was performed by splitting the full sample: first according to the lending methodology, and second, according to gender. Accordingly, this method might rule out the possibility that the income effect detected in the previous section is due to gender or lending method. Tables 7.18 and 7.19 present the estimation output from each subsample respectively. The first check was performed by splitting the whole sample into individual and group lending subsamples. Both models are significant at 1% level with F-statistics of 82.884 and 39.710 respectively. The variation of loan size is explained at 54.3% and 56.6% respectively. The income variable (INC) is significant in both specifications at 1% significance level. This implies that income is positively correlated with loan size. However, the marginal increase of loan size is close to zero.

Table 7.18 Loan size regression: lending methodology

	Individual lending		Group lending	
	B	Std. Error	B	Std. Error
(Constant)	2.019***	0.082	2.072***	0.277
INC	0.000***	0.000	0.000**	0.000
Control variables:				
EDU	0.051	0.053	-0.041	0.110
OCC	0.137***	0.032	0.253***	0.091
LGR	-0.079	0.048	-0.043	0.552
SCR	-0.100***	0.034	-0.523**	0.215
INST	0.080*	0.045	-0.014	0.063
CLL1	-0.009	0.045	0.740***	0.248
TEN	-0.017	0.040	2.072***	0.277
LTY	0.093	0.067	0.000**	0.000
No. of Obs.	622		209	
Fstat	82.884		39.710	
Prob > F	0.000		0.000	
Adj-R ²	0.543		0.566	

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

The second check was performed by splitting the whole sample into male and female borrower subsamples. Both models are significant at 1% level with F-statistics of 104.212 and 28.076 respectively. The variation of loan size is explained at 58.8% and 57.7% respectively. The income variable (INC) is significant in both specifications at 1% significance level. This implies that income is positively associated with loan size in both individual and group lending. However, the marginal increase of loan size is close to zero.

Table 7.19 Loan size regression: gender

	Male		Female	
	B	Std. Error	B	Std. Error
(Constant)	1.910***	0.091	2.013***	0.133
INC	0.000***	0.000	0.000***	0.000
Control variables:				
EDU	0.048	0.058	0.084	0.093
OCC	0.253***	0.034	0.087*	0.052
LGR	0.022	0.054	-0.106	0.082
SCR	-0.314***	0.033	-0.156***	0.051
INST	0.059	0.040	0.201***	0.065
CLL1	0.261***	0.048	-0.020	0.083
TEN	0.017	0.043	0.134**	0.067
LTY	0.077	0.083	0.040	0.115
No. of Obs.	851		180	
Fstat	104.212		28.076	
Prob > F	0.000		0.000	
Adj-R ²	0.588		0.577	

***, **, and * indicate that we reject null hypothesis at 1%, 5% and 10% level of significance, respectively.

The results of hierarchical regression and the robustness check show that variable income is a significant predictor of loan size. There are no significant relationship differences between the different categories of lending methodology and gender. The income is consistently significant in all estimated regressions. However, the extent of income effect on the loan size is not as large as expected.

7.7 Chapter summary

This chapter presented an analysis on the relationship between depth of outreach and sustainability of microfinance lending. The relationship was examined for both individual and group lending. To isolate the impact of the depth of outreach on sustainability, several control variables related to borrower and loan characteristics were added to the regressions. Two regression methods were employed including OLS linear multiple regression and Logit regression analysis. Prior to data analysis, initial examination of data was conducted for missing data, outliers, multicollinearity, and normal distribution. The problem of missing data was solved by removing some cases and a few variables.

The regression goodness of fit was assessed with the criteria of R² and F-statistics for the OLS linear multiple regression; and pseudo-R², Omnibus chi-square test, and predicted classification for the Logit regression. In addition, hierarchical and sub-sample analyses were also performed for a robustness check of the regressions. The

significance of regression parameters was verified by t-tests of each coefficient of independent variables.

The quantitative analysis has provided evidence about the relationship between depth of outreach and sustainability for both individual and group lending. The results can be summarised as follows:

1. There is statistical evidence of a relationship between gender and interest rates in individual lending:
 - a. On average, female borrowers pay 0.135% higher interest rates than male borrowers.
 - b. The differences does not necessarily mean gender discrimination, which is beyond the scope of this research and requires further investigation.
 - c. There is no statistical evidence of a relationship between gender and interest rates in group lending.
2. There is statistical evidence of a relationship between loan size and interest rates in individual lending:
 - a. On average, a decrease of loan size would increase interest rates by 0.075%.
 - b. The decrease of loan size represents deeper microfinance outreach.
 - c. There is no statistical evidence of a relationship between loan size and interest rates in group lending.
3. There is statistical evidence of a relationship between gender and loan performance in individual lending:
 - a. The likelihood of a performing loan (1-Default probability) for female borrowers is lower than for male borrowers.
 - b. There is no statistical evidence of a relationship between gender and loan performance in group lending.
4. There is statistical evidence of a relationship between loan size and loan performance in individual lending:
 - a. A decrease of loan size would decrease the likelihood of a performing loan (1-Default probability).
 - b. The decrease of loan size represents deeper microfinance outreach.
 - c. There is no statistical evidence of relationship between loan size and loan performance in group lending.
5. Loan size is the best possible proxy for borrower income. Large amounts of missing data in the income variable was the reason for using the loan size as proxy. Loan size has been used as a proxy of income in many studies. The present study also

found statistical evidence of a positive relationship between loan size and borrower income.

6. It also found statistical evidence that:
 - a. There is an association between gender and loan size. Female borrowers receive a smaller loan than male borrowers for both individual and group lending. The differences in the loan size do not necessarily mean gender discrimination, which is beyond the scope of this research and requires further investigation. The result may imply that the income of female borrowers is lower than male borrowers so that the females receive a lower loan size.
 - b. Borrowers with group lending receive a smaller loan size than borrowers in individual lending. The gap is larger for male borrowers than female borrowers. Since loan size is the proxy for income, it may imply that group lending has better outreach than individual lending in terms of the size of loan.
7. Overall, the present study found statistical evidence of a trade-off between depth of outreach and sustainability in Indonesian microfinance institutions. In particular, the trade-off was apparent only in individual lending. Whereas there is no significant relationship between depth of outreach and sustainability found in the group lending.

CHAPTER 8 RESEARCH CONCLUSION: FINDINGS, LIMITATIONS, IMPLICATIONS AND FURTHER RESEARCH

8.1 Introduction

This discussion mainly corroborates the notion that lending methodology can affect the relationship between the depth of outreach and sustainability in microfinance. The microfinance can extend loans with two lending methodologies, individual or group. The depth of outreach will be adversely associated with sustainability when loans are provided with the individual method. The trade-off occurs when lending to the poor or women results in lower interest income or worse loan performance. Joint liability via group lending can be useful for microfinance to solve the trade-off problem.

Microfinance outreach should be able to achieve the expected level of depth, in terms of poverty level or the number of women clients. Microfinance is also expected to be sustainable so that it can provide long term services to clients to be able to exit from poverty. However, lending to this client segment can be risky due to lack of collateral, a wide gap of information asymmetry, and high lending costs. This might have made this lending less attractive to private investors or commercial banks. Without government supports, the microfinance institution may be reluctant to serve the poor and may shift to wealthier clients in order to maintain sustainability. Lending methodology can be an alternative solution to microfinance to achieve both depth of outreach and sustainability.

In the past, most microfinance institutions were funded by government or donors. Sustainability became a major issue of these funded programs because of corruption and high default rates. As a result, donors and governments started introducing a different policy by transforming the microfinance institutions into subsidy-independent financial institutions. For example, Indonesia has just enacted microfinance regulation in 2013 and encouraged many existing government-funded programs that provide loans to the poor and small farmers into formal microfinance institutions. In this instance, sustainability and depth of outreach become relevant issues that needs to be resolved by both the microfinance institutions and the government.

A group of studies have focused on the role of lending methodology to solve the trade-off problem. This present research pursued this idea further by conducting research in Indonesian microfinance addressing two main research questions: 1) What is the nature of the lending methodology in Indonesian microfinance institutions in Central Java

province and what are the driving factors that shape the lending methodology?; and 2) To what extent does the adoption of a particular lending methodology affect the relationship between depth of outreach and sustainability of Indonesian microfinance institutions in Central Java province? A summary of the hypotheses testing results from the previous Chapter can be seen in Appendix 8.1. Overall, the results are in favour of group lending for microfinance institutions to achieve both depth of outreach and sustainability goals. The following sections will cover the discussion and conclude with practical implications, policy implications, limitations of the present research and future research suggestions.

8.2 Results discussion and empirical contribution

It is assumed that microfinance operates under an imperfect information market (Hoff & Stiglitz, 1990) and there are two lending options for microfinance: lending to individuals or lending to a group (Brandt et al., 1998; Ledgerwood, 1998, p. 67). These methods are different in terms of how they mitigate the problems of adverse selection and moral hazard (Hartarska & Holtmann, 2006). They may also be different in terms of the relationship between sustainability and depth of outreach (Cason et al., 2012; Kodongo & Kendi, 2013). Individual lending uses collateral and interest rates to mitigate the information problems (Stiglitz & Weiss, 1981). However, the absence of collateral or charging high interest rates may affect the sustainability and lead to a trade-off between sustainability and outreach.

On the other hand, group lending uses joint liability to minimise the information problems by imposing three mechanism. First, peer selection, where good borrowers will choose good lending partners (Varian, 1990). Second, peer monitoring, where each member will monitor the other members' performance (Islam, 1996; Stiglitz, 1990). Last, peer pressure, where members will put pressure on a default member (Besley & Coate, 1995). These mechanisms can be useful for lenders to reduce costs for selection and monitoring. The joint liability can also replace the use of collateral so that the poor, who do not have assets for collateral, can obtain loans from microfinance (Khandker et al., 1995).

In this framework, we would expect a trade-off between sustainability and depth of outreach only in individual lending, but not in group lending. Trade-off in individual lending occurs when lending to the poor or to women results in lower interest income or worse loan performance. Whereas group lending is expected to solve this problem with joint liability lending. Microfinance institutions can serve those borrowers without the expense of worsening the institution's sustainability. If this is true, then we can expect

more participation from private investors or commercial banks in poverty alleviation through sustainable group lending to the poor without heavily relying on costly government subsidised programs.

8.2.1 Lending methodology of Indonesian microfinance institutions

What is the nature of lending methodology in Indonesian microfinance institutions in Central Java province and what are the driving factors that shape the lending methodology? The interviews with microfinance institutions have revealed some important information that could answer these questions. The study found that group lending was offered only by PUAP microfinance that received funding from government through pre-existing farmer groups. The members of borrowing groups were a subset of the farmer group members. The members in the borrowing group can be different at every beginning of lending period. The microfinance institutions extended loans to these borrowing groups through the group leader. There are three important points from this information. First, group lending might rely on financial supports from the government. The interviews revealed that capital was an impediment for microfinance to extend more group loans. Access to funding from other financial institutions was also limited due to high interest rates. However, the interviews also revealed failures in many government subsidised programs due to mismanagement. Different ways of subsidising the microfinance are needed to avoid the same mistakes as in the past. Secondly, the formation of the group needs to be initiated by the community itself to ensure strong social ties among the members. The farmer group was formed long before the government subsidy of PUAP was granted to the group. The members have known each other and might have had social connectedness. This could help to improve the effectiveness of joint liability in group lending; as argued by Laffont and N'Guessan (2000), a joint liability contract will not be efficient if group members do not have information about each other's project risks. Third, it also indicates the important role of the farmer group leader in a group lending. The leader can play roles to not only select borrowers but also monitor member performance. The interviews revealed that the farmer group leader was commonly a renowned and respected person in the village. This could help the process of selection and monitoring in the group lending. A theoretical model of Carli and Uras (2017) argues that effective peer monitoring requires "asymmetric loan terms" that give a bigger role to one of the members to monitor peers. The role of group leader is also affected by the level of social ties of the leader with the members (Hermes et al., 2005).

The farmer group leader plays an important role in selection of borrowing members. This study found that character is the key information for the group leader to select the borrowers. Character itself was referred to by the respondents as the member's "credit history" rather than personality traits of the member. This information is accessible due to the localised operation of microfinance, within the area of one village. This may suggest the importance of a coverage area of microfinance that allows the group to collect local and private information about borrower character from the local village people. An operating area broader than one village may reduce the ability of the group leader in collecting private information and reduce the effectiveness of peer selection.

Microfinance lending could represent "relationship lending" that may be suitable for lending in information opaque market (Alessandrini, Fratianni, & Zazzaro, 2009, p. 15). In contrast to transaction-based lending, relationship lending relies on soft information about borrower quality. It needs proximity and close contact with the borrowers. It also requires labour intensive and costly activities. The regulator needs to limit the coverage area of the group lending to only one village to reduce searching costs and enhance the effectiveness of peer selection. Providing access to the debtor information system that is currently only available to large commercial banks could also be useful for the microfinance.

Furthermore, the study found that the majority of the group lending uses joint liability as a substitute for the loan collateral. One microfinance institution uses farmer-group internal cash as a guarantee for unpaid loans by the members. The cash is jointly owned by all the farmer group members that contribute to group fund every month. Joint liability in group lending imposes peer pressure and group sanctions to enhance repayment rates. This result suggests that group lending with joint liability can help microfinance to improve outreach even when collateral is absent.

Peer pressure or social sanction can theoretically improve repayment performance in group lending (Besley & Coate, 1995). Previous empirical evidence has shown that peer pressure may not always change the behaviour of group members (Simtowe et al., 2007; Wydick, 1999). The present study found that the localised operation of microfinance could be important to the effectiveness of peer pressure. Since the farmer group members reside in the same village and know each other, this will give pressure to any behaviour that has adverse consequences for other group members. In this case, a delinquent member will make the entire group members not able to receive subsequent loans from the microfinance institution. Nonetheless, competitors can be a threat to peer pressure success in microfinance group lending (Becchetti & Pisani, 2010). The present

study found that microfinance institutions competed with many other lenders, such as commercial banks, government programs, financial cooperatives and rural banks. If social connection between members was not strong and there were many other competitors in the market, peer pressure could not have sufficient impact on the delinquent members because they could seek credit from other institutions and did not receive social pressures from the other members.

Lastly, group lending with individual liability has been adopted in several microfinance institutions such as the Association for Social Advancement (ASA) in Bangladesh (Giné & Karlan, 2014). The microfinance institution retained group meetings while the loans were delivered with individual liability. In some cases, the group was the way of disbursing and collecting loans, instead of imposing group or joint liability (Giné & Karlan, 2014). This individual group lending was also found in the present study by which loans are delivered only through the group farmer but the loan contract is made individually and without collateral requirement. Although the borrowers are not jointly liable for the loans, it seems that microfinance may benefit from this form of lending to obtain information for borrower selection and to apply social pressure in case of a delinquent loan. However, it has not been well understood how it has influenced loan repayment and interest rates from this type of lending. Giné and Karlan (2014) conducted an experiment in a Philippine microfinance institutions by removing joint liability from existing group lending but retaining all other group mechanisms. The study found no evidence of changes in loan repayment from altering the loan liability. However, this may require further investigation into what factors will be affected if there is no joint liability imposed on group lending.

8.2.2 Lending methodology effects on the relationship between depth of outreach and sustainability

To what extent did the lending methodology affect the relationship between depth of outreach and sustainability of Indonesian microfinance institutions in Central Java province? To answer this question, two indicators of lending depth of outreach, including gender and borrower income, are discussed in this section. The first sub-section will discuss the relationship between gender and lending sustainability. The second sub-section will discuss the relationship between borrower income and lending sustainability. Both discussions contain a comparison between individual and group lending. Essentially this discussion suggests that group lending is better than individual lending in terms of dealing with the trade-off between depth of outreach and lending sustainability.

In addition, the present research found a strong association between lending methodology and loan size. Group lending was associated with smaller loan sizes. This may indicate that poorer borrowers incline more to group lending than individual lending. It may also confirm the potential benefit of group lending to improve the outreach of microfinance. This finding is based on testing the result of hypothesis 9 that lending method is associated with loan size. The statistical test confirms that the association of lending method and loan size is significant at 99% confidence level. Borrowers in group lending receive smaller loan sizes by 0.435 dollars than borrowers in individual lending. This implies that group lending borrowers might have lower income than individual lending borrowers.

Table 8.1 Previous studies on lending methodology and loan sizes

	Data	Findings
Kodongo and Kendi (2013)	Kenyan microfinance institutions	Average loan sizes in individual lending are smaller than average loan sizes in group lending.
Yang, Jialali, and Wei (2011)	A household survey in Xinjiang Uygur	Group lending is associated with bigger loan size than individual lending.

Lack of empirical studies that focuses on investigating lending methodology and loan sizes has been found (see Table 8.1). A theoretical model of Madajewicz (2011) argues that the coexistence of group and individual lending in a microfinance market can be explained by the differences in borrower wealth. Individual lending serves wealthier borrowers with relatively larger loans while group lending focuses more on poorer borrowers with smaller loans. She argues that “Joint-liability loans may not be sufficiently larger than individual loans at higher levels of wealth to compensate for the disutility of risk imposed by joint liability and the cost of monitoring” (2011, p. 122). The present research confirms the prediction of Madajewicz (2011).

However, Yang et al. (2011) found empirical evidence that borrowers demand larger loans in group lending than individual lending. This is based on data from a household survey in Xinjiang Uygur, China. They argue that the lenders provide larger loans to group borrowers because group lending is considered safer than individual lending. Similarly, Kodongo and Kendi (2013) found that group loans in Kenyan microfinance are often associated with larger loan size because the loans have lower default risks so that lenders may be inclined to provide larger loans to group lending borrowers.

Despite the inconsistency of the previous empirical findings, the present study speculates that group lending with joint liability was designed to satisfy the needs for

credit of poorer borrowers. Joint liability can be a substitute for the absence of collateral in lending for poor borrowers (Khandker et al., 1995). The previous section also found evidence that loan sizes are significantly correlated with borrower income. Hence, this may suggest that borrowers in group lending are associated with smaller loan sizes than borrowers in individual lending.

8.2.2.1 Gender and lending sustainability

The following two sub-sections will discuss the relationship between gender and sustainability in two different lending method (individual and group lending). The present research found evidence that female borrowers receive smaller loans than male borrowers. However this does not have to mean that there is gender discrimination in microfinance lending, which is beyond the scope of this research. Instead, this finding implies that female borrowers might be poorer than male borrowers. It might justify the importance of providing credit to empower women to move out of poverty. This finding is based on hypotheses testing that examined the relationship between gender and loan sizes. Hypothesis 10 states that gender is associated with loan size. However, there is only one model specification that can confirm the significant relationship between gender and loan size with 99% confidence level.

There is a lack of previous research on gender and loan sizes in microfinance. Table 8.2 shows two previous studies in relation to gender gap in loan sizes of microfinance institutions. The present study is different than previous studies in the way that it did not focus on investigating the existence of gender discrimination. Instead, the present study focused on investigating poverty level differences between female and male borrowers. The present study concludes that differences in loan sizes reflect differences in borrower income. Female borrowers receive smaller loan sizes due to lower income or higher poverty level. This is supported by the previous conclusion of Hypothesis 11 testing, that at least 95% confidence level, borrower income is associated with loan size. The loan size gap appeared in both individual and group lending.

Table 8.2 Previous studies on gender and loan sizes

	Data	Findings
Agier and Szafarz (2013)	Panel data of one microfinance institutions in Brazil	There is discrimination in loan size between female and male borrowers. Females receive smaller loans.
Corsi and De Angelis (2017)	Cross section data of a survey from microfinance in Uganda	No evidence of discrimination in loan size between female and male borrowers.

Meanwhile, Agier and Szafarz (2013) concluded that differences in loan size between males and females is due to gender discrimination, “stereotyping” and “pure-prejudice”. There is a limit to the amount that female borrowers can receive, or what they called a “glass ceiling” on loan size for women. According to them, this might impair not only the female borrowers with large projects but also the microfinance institutions because of opportunity loss. Moreover, they suggested to exercise more caution when gender is used as an indicator of poverty, since it may confuse gender bias and the poverty effect.

Corsi and De Angelis (2017) could not confirm the existence of a “glass ceiling” effect in data of microfinance in Uganda. Women who apply for bigger loans do not seem to be rationed more stringently than men. They argue that despite there still being a gender gap in loan sizes in microfinance, it does not have to be a result of discrimination against female borrowers.

While the previous studies have examined the link of loan size disparities to discrimination, the present study speculated that differences in income by gender explain the difference in loan sizes. This was motivated by many studies that used gender as an indicator for depth of outreach and poverty. Women might have relatively lower income than men (Awaworyi Churchill, 2019; Hartarska, Nadolnyak, & Mersland, 2014). However there is a lack of studies that investigate the link between income and the gender. The results of the present study might contribute to this issue by providing empirical evidence from Indonesian microfinance.

8.2.2.1.1 Gender and interest rates

This research found that lending to women with individual lending increases the interest income for microfinance. Although women have to pay higher interest costs, this increases the microfinance revenues and helps to cover high lending costs of small scale lending. Two hypotheses have been tested to examine the relationship. Hypothesis 3 proposes a conjecture that gender in individual lending is associated with interest rates. In addition, Hypothesis 4 proposes that gender in group lending is associated with interest rates. These hypotheses are to compare the gender and interest rates relationship between individual lending and group lending. The statistical analysis shows that gender in individual lending has statistically significant association with loan interest rates; and female borrowers in individual lending pay 0.135% higher interest rates per month than male borrowers. There is no strong statistical evidence of relationship between gender and interest rates in group lending.

Table 8.3 shows previous works that have investigated the connection between gender and loan interest rates. The result of the present research confirms the finding of Chen et al. (2017), Dorfleitner et al. (2013) and Meyer (2019). Female borrowers are associated with higher interest rates or higher portfolio yield. However, this is contrary to the finding from survey in Viet Nam and the U.S. Pham and Talavera (2018) analysed data of SMEs in Viet Nam and found that men pay higher interest rates and have lower probability of loan approval than women. Similarly, Asiedu et al. (2012) found evidence of differences in interest rates between different genders and races in data of a national survey in the US from 1998-2003. White male borrowers paid higher interest rates than white female borrowers. Both studies conducted surveys of borrowers who were not specifically microfinance clients. There might be a possibility that the borrowers surveyed were customers of large banks. The relationship between gender and interest rates in various types of financial institutions might be different because of differences in the client characteristics.

Table 8.3 Previous studies on gender and interest rates

	Data	Findings
Meyer (2019)	Worldwide data of 1805 microfinance institutions	Microfinance that serves only female clients is associated with 0.083 higher portfolio yield.
Pham and Talavera, (2018)	Survey of micro, small, and medium enterprises in Viet Nam	Women were charged lower interest rates than men.
Chen, Li, and Lai (2017)	Peer-to-peer lending platforms in China	Female borrowers paid higher interest rates than male borrowers.
Dorfleitner, Leidl, Priberny, and von Mosch (2013)	Worldwide data of 712 microfinance institutions	1% increase of ratio of female borrower in microfinance would increase interest rates by 0.04%.
Basharat et al. (2015)	Worldwide data of 291 microfinance institutions	Female borrower-dominated microfinance institutions charge higher interest rates.
Asiedu, Freeman, and Nti-Addae (2012)	Data of national survey in US 1998-2003	White male borrowers pay higher interest rates than white female borrowers.

Some possible explanations for differences in lending rates between men and women are found in the literature, such as because of the differences in loan sizes between men and women (Basharat et al., 2015), gender discrimination (Chen et al., 2017) or country specific reasons (Dorfleitner et al., 2013). The present research argues that income

disparity might explain the differences in interest rates between females and males. Previous sections have shown that loan sizes are correlated with borrower income. Furthermore, female borrowers are associated with smaller loan sizes. The evidence also shows loan sizes are negatively correlated to interest rates. Therefore, it can be argued that women borrowers in microfinance are associated with higher interest rates than men since the women are also associated with lower income and smaller loan sizes. However, this relationship only existed in individual lending data. No association between loan size and interest rates in group lending might explain why there is no significant relationship between gender and interest rates in group lending.

8.2.2.1.2 Gender and loan performance

This research found that individual lending to women is associated with higher probability of default. This indicates a trade-off in individual lending. There is no evidence of the trade-off in the group lending. This finding suggests that group lending can be a better option for microfinance to enhance the depth of outreach with less likelihood of impairing the lending sustainability. The findings were based on testing two hypotheses. Hypothesis 7 conjectures that gender in individual lending is associated with the likelihood of loan collectability. Hypothesis 8 speculates that gender in group lending is associated with the likelihood of loan collectability. The testing results show that loans given to female borrowers in individual lending decrease the log odds of a performing loan by 0.778 times or the odds of a performing loan by 0.459 times, holding all other independent variables constant. It confirms hypothesis 7 that gender in individual lending is associated with the likelihood of loan collectability. However, there is no strong evidence of the association between gender and loan performance in group lending.

Table 8.4 shows previous empirical studies that have investigated the link between gender and loan repayment in microfinance. The finding in the present research confirms the finding of Necesito (2016), but it does not confirm the findings of the other three studies. Adanu and Boateng (2015) found women have higher probability of repayment than men. Unlike the present study, Adanu and Boateng (2015) did not compare the relationship of gender and loan repayment between individual lending and group lending. However, although Alam et al. (2019) focused on individual lending of Canadian microfinance institutions, their study found that the odds of default likelihood for females are 0.8 times the odds of default likelihood for males. This contradicts the finding of the present research. A possible explanation for this difference is that most loans to females in the Canadian sample were not for farming activities. Whereas, most females in the present research sample are working in the farming sector. This sector may be

considered riskier, which can lead to poorer loan performance because of exogenous factors such as drought, floods, and diseases (Zamore et al., 2019). Meanwhile, the study of Dorfleitner et al. (2017) found no correlation between gender and loan performance. It was based on data from Nicaraguan microfinance institutions. However, this study did not specify the lending methodology that was being used by the microfinance institutions.

Table 8.4 Previous studies on gender and loan performance

	Data	Findings
Alam, Moir, and Ibn Boamah (2019)	Canadian microfinance institutions. Individual lending.	The repayment performance of female borrowers is slightly higher than the repayment performance of male borrowers.
Dorfleitner, Just-Marx, and Priberny (2017)	Nicaraguan microfinance institutions. Individual lending.	No evidence of relationship.
Necesito (2016)	Philippines microfinance institutions.	Portfolio at risk increases with the increase of women borrowers.
Adanu and Boateng (2015)	A microfinance institution in Ghana.	The default probability for male borrowers is higher by 1.3% than female borrowers.

The previous studies have shown mixed findings about the relationship between gender and loan performance. The present study has extended the existing literature by providing empirical evidence that the link between gender and loan performance may only occur in individual lending. There is no such relationship that has been found in group lending.

8.2.2.2 Borrower income and lending sustainability

The following two sub-sections will discuss the relationship between borrower income and lending sustainability. Borrower income was proxied by the size of loans. Based on the literature, loan sizes may reflect the poverty level of borrowers. Although Hatch and Frederick (1998) recommend microfinance and donors not to depend on loan size as an indicator of poverty, they encourage microfinance to trial different sizes of loans to match different poverty levels. They argue that loan size can exclude the wealthier only if there are competitors that provide similar services. Furthermore, the size of loans may not reflect the capacity and credibility of borrowers because microfinance offers an identical loan size to first time borrowers. The authors contend that a stronger mechanism is needed to preclude wealthier borrowers of microfinance services rather than loan sizes. Even so, outreach has been predominantly measured by loan size (Morduch, 2000).

Many studies until recently have used loan size as a proxy of poverty (Abrar, 2019; Churchill & Marr, 2017; Lebovics et al., 2016; Sheremenko et al., 2017; Widiarto et al., 2017). Besides the practicality, loan size data is simple and cost efficient to obtain (Hatch & Frederick, 1998). Microfinance devotion to help reduce poverty can be measured by the loan size, and this data is easily available in accessible sources such as the MIX Market database (Gutierrez-Nieto et al., 2009)

The present research found a significant association between loan sizes and borrower income. This implies that borrowers with lower income will borrow smaller loans. It also suggest that the use of loan size as an indicator of borrower income or poverty level might be acceptable. Hypothesis 11 predicts that income of borrower is correlated with the loan size. The results shows evidence of the correlation with a positive sign of the coefficient. This implies size of loan may reflect the income of borrowers with at least 95% confidence level. Lower income borrowers tend to borrow smaller loans. Even after splitting the whole sample into two sub-samples, individual lending and group lending, the correlation between income and loan sizes stayed positive and statistically significant.

While the present study found strong positive correlation between income and loan sizes in both group and individual lending, in the study by Ohio State University (Hatch & Frederick, 1998, p. 12), they found that lenders in group lending set the same loan size regardless of differences in income levels. Moreover, lenders in individual lending determine loan sizes according to the borrower's level of income. The reason for this difference was probably due to variation in the microfinance resource constraints (Hatch & Frederick, 1998).

In addition, analysis looked at whether or not the loan size increases with a repeat loan. The data did not show an obvious connection between loan size and the number of loans. There were many first or second loans that are bigger than an eleventh loan. The interviews revealed that capital constraints caused microfinance to not be able to provide large funding for customers. Some borrowers took bigger loans from other larger lenders.

8.2.2.2.1 Borrower income and interest rates

This research found that smaller loans in individual lending, which indicates poorer borrowers or deeper microfinance outreach, pay higher interest rates to microfinance than the larger loans. Although the poorer pay more for the interest rates, this increased microfinance revenues to cover high lending costs of small scale lending. There is no evidence of this relationship in group lending. Two hypotheses have been tested to examine the relationship between borrower income and interest rates. Hypothesis 1

proposes a conjecture that for individual lending, the borrower income (proxied by loan size) has correlation with the loan interest rates. Hypothesis 2 speculates that for group lending, the borrower income (proxied by loan size) has correlation with the loan interest rates. The hypothesis testing confirms a significant correlation between loan sizes and interest rates for individual lending, but there is no evidence of such correlation for group lending. For every 1% increase in loan sizes, the loan interest rates decrease by 0.075%, holding all other independent variables constant. In other words, the conclusion can be expressed that for every 1% decrease in loan sizes, the loan interest rates increase by 0.075%. It implies that deeper lending outreach can generate bigger interest income for microfinance.

Table 8.5 shows previous studies on borrower income and interest rates. In contrast to the current study, two previous studies used institutional-level cross-countries panel data to analyse the relationship between loan size and interest rates (Abrar, 2019; Basharat et al., 2015). The current study used borrower level data from a single country. While the previous studies found that loan size and interest rates are inversely correlated disregarding the lending methodology, the present study found evidence that the relationship is only found in individual lending. The statistical evidence shows that loan size in group lending is not correlated with the interest rates.

Table 8.5 Previous studies on borrower income and interest rates

	Data	Findings
Meyer (2019)	Panel data 1,805 observations. World data 2004 - 2013	10% decrease of loan size is associated with 0.3% increase of portfolio yield.
Abrar (2019)	382 MFIs from 70 countries (six world regions)	1 unit decrease of average loan size would increase interest rates by 0.012%.
Basharat, Hudon, and Nawaz (2015)	291 MFIs in 67 countries	1 unit decrease of average loan size / GNI p.c. would increase interest rates by around 0.17%-0.25% due to high administrative costs.

Microfinance interest rates comprise not only capital costs, default loss, and margins, but also operational costs (Rosenberg et al., 2013). The operational costs are influenced by the size of loan (Conning, 1999; Cull et al., 2009; Meyer, 2019). Costs per dollar loan for delivering credits to poorer borrowers are higher due to size of loan (Conning, 1999). These costs are included in the interest rates (Meyer, 2019). Cull et al. (2009) also found empirical evidence of a positive correlation between the costs and interest rates. The present research confirms that loan size is positively correlated with the interest rates.

However, this only applies to individual lending, while there is no evidence of such correlation in group lending. This may imply that the costs of group lending did not vary with the loan size. Group lending to the poorer with small loan size would not have a significant effect on the interest income of microfinance. The interviews with the managers also revealed that the costs for administration and repayment collection in group lending were lower than individual lending. Thus, smaller loan sizes would not affect significantly the operational costs, hence the interest rates.

8.2.2.2.2 Borrower income and loan performance

This research found that smaller loans in individual lending, which indicate poorer borrowers or deeper outreach, have higher probability of default than larger loans. This might suggest a trade-off between the outreach and sustainability of microfinance. Two hypotheses have been tested to examine the relationship between borrower income and loan performance. Hypothesis 5 proposes a conjecture that for individual lending, the borrower income (proxied by loan size) has association with loan performance. In addition, Hypothesis 6 proposes a proposition that for group lending, the borrower income (proxied by loan size) has association with loan performance. The statistical testing shows that for every 1% increase in sizes of individual loans, the log odds of a performing loan increase 0.397 times or the odds of a performing loan increase 1.487 times, holding all other independent variables constant. In other words, for every 1% decrease in loan size, the log odds of a performing loan decrease 0.397 times. Whereas, no statistical evidence has been found to confirm correlation of loan size and loan performance in group lending.

Table 8.6 shows previous studies on borrower income and loan performance. Previous studies uniformly concluded that loan sizes are associated with loan performance. Smaller loans tend to have poorer performance than bigger loans. A study of Kodongo and Kendi (2013) found evidence that the likelihood of loan delinquency may fall by 26% when loan size increases by 1 unit. They speculate that smaller loans are commonly given to inexperienced beginner borrowers or riskier borrowers. Furthermore, the study found individual lending is three times more likely to default than group lending. Similarly, Danstun and Harun (2020) and Worokinasih and Potipiroon (2019) found a decline in loan performance is associated with smaller loan sizes. Danstun and Harun (2020) argue that borrowers would commit more to the repayment of larger loans. The larger loans could also be evidence of business historical performance. Worokinasih and Potipiroon (2019) found business performance mediated the link between loan sizes and loan

performance. Bigger loans helped the businesses to generate higher income to service the repayment.

Table 8.6 Previous studies on borrower income and loan performance

	Data	Findings
Danstun and Harun (2020)	Tanzanian microfinance	PAR decreases with an increase of loan size.
Worokinasih and Potipiroon (2019)	Indonesian microfinance	Loan performance is positively related by loan size through a mediation of business performance.
Kodongo and Kendi (2013)	Kenyan microfinance	Increase of loan size would decrease the loan likelihood of default. Individual loans are more likely to default than group loans

The present research could extend this knowledge further by comparing the relationship of loan size and loan performance between individual lending and group lending. Interestingly, while loan sizes in individual lending can influence the loan performance, loan sizes in group lending have no significant relationship with the loan performance. The reason for this is likely due to information asymmetry that might have been wider in individual lending if the loans were extended to smaller loan recipients that represent borrowers with lower income, lack of collateral and lack of credit history.

8.2.3 Discussion summary and empirical contribution

To sum up the previous discussion, this research mainly concludes that group lending can be sustainable for microfinance to achieve the depth of outreach, i.e., lending to poorer borrowers or disadvantaged women borrowers. This conclusion is based on the argument that lending a small scale loan to lower income borrowers with group lending may not have a direct implication on the interest revenues and loan collectability of the microfinance. Likewise, the provision of loans to women with group lending may not directly affect the interest revenue and loan collectability of the microfinance. Whereas, although smaller loan sizes and women borrowers in individual lending are correlated with higher interest revenues, they have a significant association with lower loan collectability. Moreover, there are many competitors to microfinance, such as commercial banks, government programs and financial cooperatives. This leads to strong competition in interest rates so that microfinance may have less opportunity to improve revenues by increasing the interest rates.

There is also an indication that poorer borrowers might prefer group lending to individual lending. This is probably the case since the group lending was associated with lower

average loan sizes, which suggests lower income or poorer borrowers. Besides, this lending uses joint liability that replaces the collateral requirement. It might be favourable to the poorer borrowers due to lack of collateral that might impede access to credit for the poor.

Although the ultimate goal of sustainable microfinance is an independency on subsidy, temporary government support for microfinance to aid the development of group lending might still be needed, especially for small scale microfinance. The variable operational costs for group lending might be lower than individual lending, since the microfinance institutions can reduce costs for selection and monitoring. However, the interest revenues might not be sufficient to cover fixed operational costs such as salary and utilities. Government needs to support the microfinance institutions to achieve the economies of scale by facilitating affordable external financing.

This study contributes to the literature of microfinance in at least the following ways: First, the literature show that sustainability would be an impediment for microfinance to achieve deeper outreach due to asymmetry information problems. Some studies have investigated the role that group lending can play to mitigate these problems. The present research offers empirical evidence suggesting that this trade-off might only occur in individual lending. No significant evidence was found of the trade-off in group lending.

Second, loan size has been widely used as a measurement for the poverty level of borrowers in microfinance literature. However, specific investigation into the link between loan sizes and borrower income is scarce. The present research offers additional empirical evidence to confirm the reliability of loan sizes to be used as a poverty indicator of microfinance borrowers.

Third, women's empowerment is an important goal of microfinance. There are few studies that have investigated the factors causing differences in loan size between females and males in microfinance. One study suggests that the difference was caused by taste-based gender discrimination. However, another study could not confirm the existence of discrimination and suggested credit rationing as the cause for the differences. The present study argues that disparity in loan sizes between genders is associated with differences in income. Female borrowers in microfinance are associated with lower income than male borrowers, therefore the lenders might extend smaller loans to women in accordance with the income level.

Fourth, a theory argues that group and individual lending coexist because group lending serves lower income people whereas individual lending serves the wealthier. However, few empirical studies have suggested that group lending is related to bigger loan sizes

than individual lending. The present study offers further empirical evidence supporting the theory that group lending is associated with smaller loan size, which represents lower income borrowers.

Fifth, while previous studies have suggested that interest rate disparity between females and males is explained by gender discrimination, the size of loans, and country specific reasons, the present study proposes that income level might also explain the disparity of interest rates between female and male borrowers in microfinance. It can be seen from the evidence that there is a strong association between loan size and borrower income. The study also found evidence that group lending might have changed the relationship so that there is no evidence of a relationship between gender and interest rates.

Sixth, previous studies have shown mixed findings about the relationship between gender and loan performance. The present study might contribute to the existing literature by providing empirical evidence that the link between gender and loan performance may only occur in individual lending. There is no such relationship that has been found in group lending.

Seventh, the literature shows that operational costs are one of the components of interest rates. Operational costs are negatively correlated with loan size. Microfinance translates this costs into interest rates that are charged to the borrowers. The present research provides empirical evidence that a negative correlation between loan sizes and interest rates can only be found in individual lending. There is no evidence of the reverse relationship between loan sizes and interest rates in group lending. A possible explanation is that the costs for administration and repayment collection can be minimised in group lending. Thus, smaller loan sizes would not significantly affect the operational costs, hence the interest rates.

Eight, previous studies have found evidence that bigger loan sizes are associated with better loan performance or lower probability of default. The present research shows empirical evidence that the positive correlation between loan size and loan performance might only occur in individual lending. Group mechanisms of peer selection, peer monitoring and peer pressures might help to minimise the default probability in group lending.

8.3 Implications for Indonesian microfinance institutions

There are several possible implications for Indonesian microfinance institutions, particularly in Central Java province, that emerge from the findings of the present

research. Some of these may be worth mentioning here, although they have not been subject to the detailed research that is required.

One of the central findings of this research is the desirable benefit of group lending for microfinance to achieve the twin objectives including depth of outreach and sustainability. The evidence shows that while loan provision to women borrowers and poorer borrowers with individual lending can provide microfinance institutions higher interest income, it exposes them to lower probability of loan collectability. In contrast, the same provision with group lending seems to show no significant association with the interest rates and loan collectability. Based on that finding, it may be desirable, in terms of achieving the twin goals of social outreach and financial sustainability, for microfinance institutions to allocate a greater proportion of their loan portfolio through group lending to women borrowers and to poorer borrowers. Two financial issues constrain the extent to which MFIs can pursue this course: the generation of sufficient operating income to at least cover operating costs, and the availability of capital to support an increase in group lending.

As is to be expected, the greatest interest revenue is generated from the larger individual loans, even though these tend to have lower interest rates than many smaller loans. With lower operating costs per unit of interest revenue for these larger loans, they are important in generating a surplus to cover operating costs. Thus a big shift to group lending might limit the institutions ability to cover these costs. For some institutions a possible solution for this issue might be giving a greater allocation of funds for group lending while keeping a substantial proportion in individual lending. Alternatively, the microfinance institutions might be given access to cheaper loanable funds, with some government support, to assist them to cover the operating costs of a higher level of group lending to achieve social objectives.

There is also the related issue of the capital base of microfinance institutions. As discussed in Section 6.3 (see also Appendix 6.1), the funding sources of the MFIs studied are limited, and in some cases precarious. Virtually all of the MFIs studied have derived their base capital from government sources, mainly from the now-ended PUAP program. They raise new capital from their members in terms of various forms of savings mobilisation (see Table 6.4), but they have limited ability to raise capital from the poorer borrowers involved in group lending. Thus if there is to be pronounced shift to group lending this will probably need to be supported by policy action on the capital front also.

Another finding of the study is that most group lending uses joint liability as a substitute for loan collateral, while a requirement for collateral is common in individual lending.

Many poor people and women are presumably not able to apply for loans due to lack of collateral, so that granting loans in group lending without collateral may increase their ability to borrow. Thus there seems to be a case for microfinance institutions to further reach out the poorer borrowers and women borrowers with group lending using joint liability rather than collateral. Moreover, previous studies have shown that the benefit of joint liability can be optimized when some mechanisms are in place in the lending process. Those mechanisms includes peer selection, peer monitoring and peer pressures. Therefore, it may be useful for the microfinance institutions to optimize the benefits of the joint liability approach by further developing appropriate group lending methodologies including peer selection, peer monitoring, and peer pressure.

8.4 Policy implications

As discussed in the previous section, the expansion of group lending could be desirable for microfinance institutions to achieve the twin objectives of social outreach and financial sustainability. A major policy issue is thus whether Indonesia's is prepared to take policy action, either in terms of regulatory change or financial support, to foster the expansion of group lending in Indonesian microfinance institutions.

The existing policies on microfinance institutions according to The Microfinance Institution Act No. 1 (2013) article 1 specifies the goal of microfinance in increasing the income and welfare of low-income and poor people, but there is no further reference to this goal and only one reference to group lending. If group lending is indeed a key way of achieving the goal, these regulations should be redrafted to address group lending more specifically. For example, the coverage restrictions for microfinance lending need to be differently regulated for the two types of lending.

The peer selection and peer pressure processes in group lending typically operate within a limited geographical area. The farmer group leader plays an important role in selection of borrowing members. A close contact between the group leader and the members could help the leader to obtain essential information to assess the applicant credibility. This mechanism might only work well if the leader and the members live in proximity. The interviews also revealed that the localised operation of microfinance is an important factor of the peer pressure effectiveness. The pressure could be more intense when the borrowers are living in the same location. Thus the regulations should address the coverage restrictions for group lending separately from those for lending to individuals, perhaps with a view to requiring more localised operations for the former.

There has been a widespread attempt, in Indonesia and other countries and over several decades, to find ways in which microfinance can improve the income and welfare of low-income and poor people without resort to financial support from governments or NGOs.

This study suggests that, at least for the region and the institutions studied, this is difficult to achieve, even by the use of group lending. There are two financial issues: one is how a portfolio of small loans to poor men and women can generate sufficient net revenue to cover operating costs in a sustainable way, and the other is how capital to expand group lending can be raised from such a low income group. If the Indonesian Government is interested in expanding group lending as a way of reducing poverty in rural areas it needs to address these issues. Solutions might involve the provision of interest rate subsidies and/or additional capital to microfinance institutions, targeted only to group lending.

8.5 Research limitations and further work

Like any research study, this present research is not without its limitations. This research has mainly focussed on the lending side of the microfinance institutions. As such, this research has not considered the whole microfinance business process. Sustainability may also be affected by microfinance saving activities that are beyond the scope of this research.

Caution should be exercised in generalising the findings to other microfinance institutions in different cultural setting and economic contexts in other regions of Indonesia, let alone other countries. This study has focused only on microfinance institutions that operate in the Central Java province of Indonesia, with only 20 institutions being the sample. The proportions of group and individual lending in the data were unequal. The sample was taken with a convenience sampling method rather than random sampling one. This might have result in sampling bias despite the large sample size of the loan records that have been collected. There was an issue in the early process of this research where some microfinance institutions that were initially selected as samples could not be reached or were unwilling to participate.

This research has used loan sizes as the main indicator for borrower poverty level. The loan size data were taken from the microfinance institutions' lending records. Although the best measurement for poverty level is through direct income surveys of the borrowers, trying to obtain exact measures of income would have expanded the research considerably. It would have required a considerable amount of time and cost since it would have to be conducted with face-to-face surveys and the potential respondents were located in a remote rural province. A survey by mail would have resulted in poor data quality and a low response rate.

This research has used cross-sectional data of the microfinance institution lending for the reasons of time and resource constraints. Given the nature of cross-sectional studies, this study examined the relationship between the sustainability, depth of outreach and lending methodology at only a point of time. It could not capture the relationship dynamics across time periods. Thus, the analysis of behaviour dynamics of both lenders and borrowers over time were not covered in the present thesis.

Meanwhile, more research is required to expand our understanding of the relationship between microfinance depth of outreach and sustainability, as well as the influence of lending methodology on the relationship. Needless to say, further research is required in the following areas:

1. Group lending with joint liability involves peer selection, peer monitoring and peer pressure on the borrowing members. Beside the positive impacts, these mechanisms might have unfavourable impacts on members, such as borrower project profitability (Fischer, 2013), collusive behaviour (Laffont & N'Guessan, 2000), excessive punishment (Czura, 2015), social costs (Montgomery, 1996), and discouraging innovation (Hirth & Pestonjee, 2016). Therefore, a promising direction for future research might be to investigate the impact of group lending on women and small borrowers in the Indonesian context.
2. Banking literature has been investigating the relationship between lending and gender. However, little research has been conducted on that relationship in microfinance literature in terms of loan sizes and interest rates. There is the possibility that the disparity in interest rates is caused by discrimination, as argued by Agier and Szafarz (2013) or loan sizes (Basharat et al., 2015). Future studies might be required to investigate the possibility of gender discrimination in Indonesian microfinance lending.
3. This research found statistical evidence that loan size is positively correlated to borrower income. However, the research used income data collected by the microfinance institutions. Although the loan size has been used as proxy for income in much previous research, further research is required to specifically examine this relationship by collecting income data directly from borrower surveys in Indonesian microfinance.
4. Future research requires incorporating a larger sample size for both individual and group lending from Indonesian microfinance institutions. It would also be necessary to compare the relationship between trade-off and sustainability in different regions of Indonesia to capture the effects of cultural differences in the relationship.

5. The future research may need to be conducted using a longitudinal studies with panel data. The studies could better capture the dynamic behaviour of lenders and the borrowers in relation to depth of outreach, sustainability and lending methodology. They would require more sophisticated analysis techniques such as fixed effect models, random effect models or independent pooled panels. The results could enrich our understanding on the microfinance institution lending and the twin objectives.
6. Geographical distance between group lending members may affect peer selection, peer monitoring and peer pressure. The members' ability to produce private information can increase with proximity (Alessandrini et al., 2009, p. 15). Social ties among the members may also be affected by distance. Investigation of the relationship between geographical distance and the effectiveness of group lending can be further researched to deepen our understanding about group mechanisms.
7. Although lending is the main income generating activity of Indonesian microfinance, further studies could be useful to evaluate microfinance sustainability and outreach not only in specific lending activities but also at the institutional level. It might be able to capture the complete picture of the microfinance institution's social and financial performance.

REFERENCES

- Abate, G. T., Borzaga, C., & Getnet, K. (2014). Cost-efficiency and outreach of microfinance institutions: Trade-offs and the role of ownership. *Journal of International Development*, 26(6), 923-932. doi:10.1002/jid.2981
- Abbink, K., Irlenbusch, B., & Renner, E. (2006). Group size and social ties in microfinance institutions. *Economic Inquiry*, 44(4), 614-628. doi:10.1093/ei/cb1001
- Abdullah, S., & Quayes, S. (2016). Do women borrowers augment financial performance of MFIs? *Applied Economics*, 48(57), 5593-5604. doi:10.1080/00036846.2016.1181831
- Abrar, A. (2019). The impact of financial and social performance of microfinance institutions on lending interest rate: A cross-country evidence. *Cogent Business & Management*, 6(1), 1540072. doi:10.1080/23311975.2018.1540072
- Adam, L., & Lestari, E. (2017). Indonesia's guaranteed microfinance programme (KUR): Lessons from the first stage of implementation. *Journal of Southeast Asian Economies*, 34(2), 322-344. doi:10.1355/ae34-2e
- Adams, D. W., Graham, D. H., & Von Pischke, J. D. (1984). *Undermining rural development with cheap credit*. Boulder, CO: Westview Press.
- Adanu, K., & Boateng, E. (2015). Predicting loan repayment default among second tier borrowers in Ghana. *International Journal of Entrepreneurship and Small Business*, 24(3), 417-432. doi:10.1504/IJESB.2015.067466
- Agier, I., & Szafarz, A. (2013). Microfinance and gender: Is there a glass ceiling on loan size? *World Development*, 42, 165-181. doi:10.1016/j.worlddev.2012.06.016
- Ahlin, C., & Townsend, R. M. (2007). Using repayment data to test across models of joint liability lending. *Economic Journal*, 117(517), F11-F51. doi:10.1111/j.1468-0297.2007.02014.x
- Al-Azzam, M. (2019). Financing microfinance institutions: Subsidies or deposit mobilisation. *Applied Economics*, 51(15), 1621-1633. doi:10.1080/00036846.2018.1527467
- Al-Azzam, M., Carter Hill, R., & Sarangi, S. (2012). Repayment performance in group lending: Evidence from Jordan. *Journal of Development Economics*, 97(2), 404-414. doi:10.1016/j.jdeveco.2011.06.006
- Alam, J., Moir, R., & Ibn Boamah, M. (2019). Gender and micro-credit: Who repays? Evidence from a Canadian individual-lending approach. *Journal of Small Business and Entrepreneurship*. doi:10.1080/08276331.2019.1606966
- Alessandrini, P., Fratianni, M., & Zazzaro, A. (2009). *The changing geography of banking and finance*. Dordrecht, the Netherlands: Springer.
- Ambarkhane, D., Singh, A. S., & Venkataramani, B. (2018). Measuring total factor productivity change of microfinance institutions in India using Malmquist productivity index. *Indian Growth and Development Review*, 12(1), 105-130. doi:10.1108/IGDR-12-2017-0105
- Arnold, L. G., Reeder, J., & Steger, S. (2013). On the viability of group lending when microfinance meets the market: A reconsideration of the Besley-Coate model. *Journal of Emerging Market Finance*, 12(1), 59-106. doi:10.1177/0972652712473403
- Arrassen, W. (2017). The determinants of MFIs' social and financial performances in sub-Saharan Africa: Has mission drift occurred? *Annals of Finance*, 13(2), 205-235. doi:10.1007/s10436-017-0296-x
- Arsyad, L. (2005). *An assessment of performance and sustainability of Microfinance Institutions: A case study of Village credit institutions in Gianyar, Bali, Indonesia*. Flinders University, Faculty of Social Sciences.
- Asian Development Bank. (2000). *Finance for the poor: microfinance development strategy*. Manila: Asian Development Bank.

- Asiedu, E., Freeman, J. A., & Nti-Addae, A. (2012). Access to credit by small businesses: How relevant are race, ethnicity, and gender? *American Economic Review*, 102(3), 532-537. doi:10.1257/aer.102.3.532
- Attanasio, O., Augsborg, B., De Haas, R., Fitzsimons, E., & Harmgart, H. (2014). *Group lending or individual lending? Evidence from a randomised field experiment in Mongolia*. Retrieved from <https://mpra.ub.uni-muenchen.de/35439/>
- Awaworyi Churchill, S. (2018). Sustainability and depth of outreach: Evidence from microfinance institutions in sub-Saharan Africa. *Development Policy Review*, 36, O676-O695. doi:10.1111/dpr.12362
- Awaworyi Churchill, S. (2019). Microfinance financial sustainability and outreach: Is there a trade-off? *Empirical Economics*. doi:10.1007/s00181-019-01709-1
- Aye, H. P., & Nakamori, Y. (2013). *Constructing a client recruitment system for rural Myanmar unbanked people to access PACT microfinance institution*. Paper presented at the 57th Annual Meeting of the International Society for the Systems Sciences, ISSS 2013: Curating the Conditions for a Thrivable Planet.
- Bakker, A., Schaveling, J., & Nijhof, A. (2014). Governance and microfinance institutions. *Corporate Governance (Bingley)*, 14(5), 637-652. doi:10.1108/CG-03-2014-0032
- Basharat, B., Hudon, M., & Nawaz, A. (2015a). Does efficiency lead to lower prices? A new perspective from microfinance interest rates. *Strategic Change: Briefings in Entrepreneurial Finance*, 24(1), 49-66.
- Baskara, I. (2014). Lembaga Keuangan Mikro di Indonesia. *Buletin Studi Ekonomi*, 18(2).
- Bassem, B. S. (2009). Governance and performance of microfinance institutions in Mediterranean countries. *Journal of Business Economics and Management*, 10(1), 31-43. doi:10.3846/1611-1699.2009.10.31-43
- Becchetti, L., & Pisani, F. (2010). Microfinance, subsidies and local externalities. *Small Business Economics*, 34(3), 309-321. doi:10.1007/s11187-008-9125-y
- Beck, T. (2015). Microfinance—A critical literature survey. *IEG working paper* (4). Washington DC: World Bank Group.
- Becker, G. S. (1971). *The economics of discrimination* [electronic resource]. Chicago: University of Chicago Press.
- Berenbach, S. (1997). Regulation and supervision of microfinance institutions: Case study on Indonesia. *Micro-Finance Network Occasional Paper* (2). Centre for Financial Inclusion. Retrieved from <https://centerforfinancialinclusionblog.files.wordpress.com/2011/10/regulation-and-supervision-of-microfinance-institutions.pdf>
- Berg, B. L., & Lune, H. (2017). *Qualitative Research Methods for the Social Sciences*, Global Edition (Vol. 9th edition). Harlow, England: Pearson.
- Besley, T., & Coate, S. (1995). Group lending, repayment incentives and social collateral. *Journal of Development Economics*, 46(1), 1-18. doi:10.1016/0304-3878(94)00045-E
- Bhatt, N., & Tang, S.-Y. (2001). Making microcredit work in the United States: Social, financial, and administrative dimensions. *Economic Development Quarterly*, 15(3), 229-241. doi:10.1177/089124240101500303
- Bibi, U., Balli, H. O., Matthews, C. D., & Tripe, D. W. L. (2018). New approaches to measure the social performance of microfinance institutions (MFIs). *International Review of Economics and Finance*, 53, 88-97. doi:10.1016/j.iref.2017.10.010
- Biggar, N. (2009). Measuring poverty outreach: How two different microfinance institutions used the Progress out of Poverty Index. *Enterprise Development and Microfinance*, 20(3), 177-187. doi:10.3362/1755-1986.2009.018
- Blackstone, A. (2019) *Principles of sociological inquiry: Qualitative and quantitative methods*. Minneapolis: Open Textbook Library.
- Blanco-Oliver, A., Irimia-Dieguez, A., & Reguera-Alvarado, N. (2016). Prediction-oriented PLS path modeling in microfinance research. *Journal of Business Research*, 69(10), 4643-4649. doi:10.1016/j.jbusres.2016.03.054

- Boot, A. W. A. (2000). Relationship banking: What do we know? *Journal of Financial Intermediation*, 9(1), 7-25. doi:10.1006/jfin.2000.0282
- Bos, J. W. B., & Millone, M. (2015). Practice what you preach: Microfinance business models and operational efficiency. *World Development*, 70, 28-42. doi:10.1016/j.worlddev.2014.12.018
- Brandt, L., Epifanova, N., & Klepikova, T. (1998). *Lending methodology module*. Seattle, WA: The Russia Microfinance Project. Retrieved from <https://microfinancearena.com/review/lending-methodology-module/>
- Bratton, M. (1986). Financing smallholder production: A comparison of individual and group credit schemes in Zimbabwe. *Public Administration and Development*, 6(2), 115-132. doi:10.1002/pad.4230060202
- Brau, J. C., & Woller, G. M. (2004). Microfinance: A comprehensive review of the existing literature. *The Journal of Entrepreneurial Finance*, 9(1), 1-27.
- Braverman, A., & Guasch, J. L. (1986). Rural credit markets and institutions in developing countries: Lessons for policy analysis from practice and modern theory. *World Development*, 14(10-11), 1253-1267.
- Brière, M., & Szafarz, A. (2015). Does commercial microfinance belong to the financial sector? Lessons from the stock market. *World Development*, 67, 110-125. doi:10.1016/j.worlddev.2014.10.007
- Brooks, C. (2008). *Introductory econometrics for finance* [electronic resource] (2nd ed.). Cambridge [England]; New York: Cambridge University Press.
- Brunori, L., & Pines, M. (2013). *The other side of the coin: The psychological aspect of microcredit*. Hauppauge, NY: Nova Science Publishers.
- Bryman, A. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research*, 6(1), 97-113. doi:10.1177/1468794106058877
- Calidoni, F., & Fedele, A. (2009). Profit-maximizing behaviour replaces social sanctions in urban microcredit markets: The case of Italian MAGs. *Economics of Transition*, 17(2), 329-349. doi:10.1111/j.1468-0351.2009.00352.x
- Campbell, N. D., & Rogers, T. M. (2012). Microfinance institutions: A profitable investment alternative. *Journal of Developmental Entrepreneurship*, 17(4). doi:10.1142/S1084946712500240
- Carli, F., & Uras, B. R. (2017). Joint-liability with endogenously asymmetric group loan contracts. *Journal of Development Economics*, 127, 72-90. doi:10.1016/j.jdeveco.2017.03.003
- Carpenter, J., & Williams, T. (2014). Peer monitoring and microcredit: Field experimental evidence from Paraguay. *Oxford Development Studies*, 42(1), 111-135. doi:10.1080/13600818.2014.887061
- Caserta, M., Monteleone, S., & Reito, F. (2018). The trade-off between profitability and outreach in microfinance. *Economic Modelling*, 72, 31-41. doi:10.1016/j.econmod.2018.01.003
- Cason, T. N., Gangadharan, L., & Maitra, P. (2012). Moral hazard and peer monitoring in a laboratory microfinance experiment. *Journal of Economic Behavior and Organization*, 82(1), 192-209. doi:10.1016/j.jebo.2012.02.003
- Cassar, A., Crowley, L., & Wydick, B. (2007). The effect of social capital on group loan repayment: Evidence from field experiments. *Economic Journal*, 117(517), F85-F106. doi:10.1111/j.1468-0297.2007.02016.x
- Cassar, A., & Wydick, B. (2010). Does social capital matter? Evidence from a five-country group lending experiment. *Oxford Economic Papers*, 62(4), 715-739. doi:10.1093/oep/gpq010
- Cavalluzzo, K. S., Cavalluzzo, L. C., & Wolken, J. D. (2002). Competition, small business financing, and discrimination: Evidence from a new survey. *The Journal of Business*, 75(4), 641-679. doi:10.1086/341638

- Chakraborty, A., & Hu, C. X. (2006). Lending relationships in line-of-credit and nonline-of-credit loans: Evidence from collateral use in small business. *Journal of Financial Intermediation*, 15(1), 86-107. doi:10.1016/j.jfi.2005.07.002
- Chen, D., Li, X., & Lai, F. (2017). Gender discrimination in online peer-to-peer credit lending: Evidence from a lending platform in China. *Electronic Commerce Research*, 17(4), 553-583. doi:10.1007/s10660-016-9247-2
- Chowdhury, P. R. (2007). Group-lending with sequential financing, contingent renewal and social capital. *Journal of Development Economics*, 84(1), 487-506. doi:10.1016/j.jdeveco.2006.01.001
- Churchill, S. A. (2017). Microfinance and ethnic diversity. *Economic Record*, 93(300), 112-141. doi:10.1111/1475-4932.12310
- Churchill, S. A., & Marr, A. (2017). Sustainability and outreach: A comparative study of MFIs in South Asia and Latin America and the Caribbean. *Bulletin of Economic Research*, 69(4), E19-E41. doi:10.1111/boer.12100
- Cole, D., Cole, D. C., & Slade, B. F. (1999). *Building a modern financial system: The Indonesian experience*. Cambridge, MA: Cambridge University Press.
- Conning, J. (1999). Outreach, sustainability and leverage in monitored and peer-monitored lending. *Journal of Development Economics*, 60(1), 51-77. doi:10.1016/S0304-3878(99)00036-X
- Cooper, D. R., & Schindler, P. S. (2014). *Business research methods* (12th ed.). New York, NY : McGraw-Hill/Irwin.
- Corsi, M., & De Angelis, M. (2017). Gender discrimination in microfinance? Some evidence from Uganda. *The Journal of Development Studies*, 53(5), 723-740. doi:10.1080/00220388.2016.1205733
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). New Delhi, India: SAGE Publications India Pvt, Ltd.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice*, 39(3), 124.
- Crouch, M., & McKenzie, H. (2006). The logic of small samples in interview-based qualitative research. *Social Science Information*, 45(4), 483-499.
- Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2007). Financial Performance and Outreach: A Global Analysis of Leading Microbanks. *The Economic Journal*, 117(517), F107-F133.
- Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2009). Microfinance meets the market. *The Journal of Economic Perspectives*, 23(1), 167-192.
- Cull, R., Demirgüç-Kunt, A., & Morduch, J. (2014). Banks and microbanks. *Journal of Financial Services Research*, 46(1), 1-53. doi:10.1007/s10693-013-0177-z
- Curtis, E., & Drennan, J. (2013). *Quantitative health research: Issues and methods*. Maidenhead: McGraw-Hill Education.
- Czura, K. (2015). Pay, peek, punish? Repayment, information acquisition and punishment in a microcredit lab-in-the-field experiment. *Journal of Development Economics*, 117, 119-133. doi:10.1016/j.jdeveco.2015.07.009
- D'Espallier, B., Guérin, I., & Mersland, R. (2011). Women and repayment in microfinance: A global analysis. *World Development*, 39(5), 758-772. doi:10.1016/j.worlddev.2010.10.008
- D'Espallier, B., Guerin, I., & Mersland, R. (2013). Focus on women in microfinance institutions. *Journal of Development Studies*, 49(5), 589-608. doi:10.1080/00220388.2012.720364
- Danstun, N., & Harun, M. (2020). The effect of credit collection policy on portfolio at risk of microfinance institutions in Tanzania. *Studies in Business and Economics*, 14(3), 131-144. doi:10.2478/sbe-2019-0049

- de Aghion, B. A. (1999). On the design of a credit agreement with peer monitoring. *Journal of Development Economics*, 60(1), 79-104. doi:10.1016/S0304-3878(99)00037-1
- de Aghion, B. A., & Gollier, C. (2000). Peer group formation in an adverse selection model. *Economic Journal*, 110(465), 632-643. doi:10.1111/1468-0297.00557
- de Aghion, B. A., & Morduch, J. (2005). *The economics of microfinance*. Cambridge, MA: MIT press.
- de Quidt, J., Fetzer, T., & Ghatak, M. (2016). Group lending without joint liability. *Journal of Development Economics*, 121, 217-236. doi:10.1016/j.jdeveco.2014.11.006
- Di Benedetto, C., & Bengo, I. (2014) Microcredit system for building rehabilitation and strengthening arts and crafts. In A. Del Bo & D. Fabrizio Bignami (Eds.), *Sustainable social, economic and environmental revitalization in Multan City* (pp. 57-67). Dordrecht: Springer.
- Di Martino, P., & Sarsour, S. (2012). Microcredit in Palestine (1995-2008): A business history perspective. *Business History*, 54(3), 441-461. doi:10.1080/00076791.2011.638501
- Diaz-Serrano, L., & Sackey, F. G. (2018). Microfinance and credit rationing: Does the microfinance type matter? *Journal of Sustainable Finance & Investment*, 8(2), 114-131. doi:10.1080/20430795.2017.1403181
- Dorflleitner, G., Just-Marx, S., & Priberny, C. (2017). What drives the repayment of agricultural micro loans? Evidence from Nicaragua. *The Quarterly Review of Economics and Finance*, 63, 89-100. doi:10.1016/j.qref.2016.02.009
- Dorflleitner, G., Leidl, M., Priberny, C., & von Mosch, J. (2013). What determines microcredit interest rates? *Applied Financial Economics*, 23(20), 1579-1597. doi:10.1080/09603107.2013.839860
- Doss, C., Meinzen-Dick, R., Quisumbing, A., & Theis, S. (2018). Women in agriculture: Four myths. *Global food security*, 16, 69-74.
- Duggan, C. S. M. (2016). Doing bad by doing good? Theft and abuse by lenders in the microfinance markets of Uganda. *Studies in Comparative International Development*, 51(2), 189-208. doi:10.1007/s12116-015-9211-5
- Erwin, K., Abubakar, E., & Muda, I. (2018). The relationship of lending, funding, capital, human resource, asset liability management to non-financial sustainability of rural banks (BPRs) in Indonesia. *Journal of Applied Economic Sciences*, 13(2), 520-542.
- Esterberg, K. G. (2002). *Qualitative methods in social research*: Boston: McGraw-Hill.
- Fall, F., Akim, A. M., & Wassongma, H. (2018). DEA and SFA research on the efficiency of microfinance institutions: A meta-analysis. *World Development*, 107, 176-188. doi:10.1016/j.worlddev.2018.02.032
- Farida, F., Osman, I. R., Lim, A. K., & Wahyuni, N. (2018). Efficiency of formal microfinance in Indonesia: Using data envelopment analysis application. *Iranian Economic Review*, 22(3), 787-810. doi:10.22059/ier.2018.66644
- Farida, F., Siregar, H., Nuryartono, N., & Eka Intan, K. P. (2016). An impact estimator using propensity score matching: People's business credit program to micro entrepreneurs in Indonesia. *Iranian Economic Review*, 20(4), 599-615.
- Farida, F., Siregar, H., Nuryartono, N., & Intan K. P, E. (2015). Micro enterprises' Access to People business credit program in Indonesia: Credit rationed or non-credit rationed? *International Journal of Economic Perspectives*, 9(2), 57-70.
- Fischer, G. (2013). Contract structure, risk-sharing, and investment choice. *Econometrica*, 81(3), 883-939. doi:10.3982/ECTA9100
- Fitri, R. (2006). *Informal finance and poverty alleviation: a grassroots study of small farmers' credit in West Sumatra, Indonesia* (Unpublished doctoral thesis. Massey University, Palmerston North, New Zealand.
- Fitriasari, T., & Dalimunthe, Z. (2019). The effectiveness of linkage programs: Case study of BMTs in Indonesia. *International Journal of Business and Society*, 20(S1), 210-220.

- Gangopadhyay, S., & Lensink, R. (2014). Asymmetric group loans, non-assortative matching and adverse selection. *Economics Letters*, 124(2), 185-187. doi:10.1016/j.econlet.2014.05.010
- García-Pérez, I., Muñoz-Torres, M.-J., & Fernández-Izquierdo, M.-Á. (2017). Microfinance literature: A sustainability level perspective survey. *Journal of Cleaner Production*, 142, Part 4, 3382-3395. doi:10.1016/j.jclepro.2016.10.128
- Gelade, W., & Guirking, C. (2018). The enforcement advantage of external monitoring: Lessons from an experiment with joint-liability groups in Burkina Faso. *Journal of Economic Behavior and Organization*, 151, 307-325. doi:10.1016/j.jebo.2018.04.022
- Ghatak, M. (1999). Group lending, local information and peer selection. *Journal of Development Economics*, 60(1), 27-50. doi:10.1016/S0304-3878(99)00035-8
- Ghatak, M. (2000). Screening by the company you keep: Joint liability lending and the peer selection. *Economic Journal*, 110(465), 601-631. doi:10.1111/1468-0297.00556
- Ghatak, M., & Guinnane, T. W. (1999). The economics of lending with joint liability: Theory and practice. *Journal of Development Economics*, 60(1), 195-228. doi:10.1016/S0304-3878(99)00041-3
- Ghauri, P. N., Grønhaug, K., & Kristianslund, I. (1995). *Research methods in business studies : A practical guide*: New York : Prentice Hall.
- Gibbs, G. (2007). *Analyzing qualitative data* [electronic resource]. Los Angeles, CA; London: SAGE.
- Giné, X., Harigaya, T., Karlan, D., & Nguyen, B. T. (2006) Evaluating microfinance program innovation with randomized control trials: An example from group versus individual lending. Vol. 16. *ERD Technical Note Series* (pp. 1-20).
- Giné, X., & Karlan, D. S. (2014). Group versus individual liability: Short and long term evidence from Philippine microcredit lending groups. *Journal of Development Economics*, 107, 65-83. doi:10.1016/j.jdeveco.2013.11.003
- Godquin, M. (2004). Microfinance repayment performance in Bangladesh: How to improve the allocation of loans by MFIs. *World Development*, 32(11), 1909-1926. doi:10.1016/j.worlddev.2004.05.011
- González Vega, C. (1998). *Microfinance: Broader achievements and new challenges*. Economics and Sociology Occasional Paper. Ohio State University. Department of Agricultural, Environmental, and Development Economics. Retrieved from <http://hdl.handle.net/1811/66761>
- Green, S. B. (1991). How many subjects does it take to do a regression analysis. *Multivariate Behavioral Research*, 26(3), 499. doi:10.1207/s15327906mbr2603_7
- Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research *Handbook of qualitative research*. (pp. 105-117). Thousand Oaks, CA, US: Sage Publications, Inc.
- Gujarati, D. N. (2003). *Basic econometrics / Damodar N. Gujarati* (4th ed.). Boston, MA: McGraw-Hill.
- Gutierrez-Goiria, J., San-Jose, L., & Retolaza, J. L. (2017). Social efficiency in microfinance institutions: Identifying how to improve it. *Journal of International Development*, 29(2), 259-280. doi:10.1002/jid.3239
- Gutierrez-Nieto, B., Serrano-Cinca, C., & Molinero, C. M. (2009). Social efficiency in microfinance institutions. *The Journal of the Operational Research Society*, 60(1), 104-119.
- Guttman, J. M. (2008). Assortative matching, adverse selection, and group lending. *Journal of Development Economics*, 87(1), 51-56. doi:10.1016/j.jdeveco.2007.06.002
- Hair, J. F. Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

- Hair, J. F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Harlow: Pearson Education Limited.
- Hamada, M. (2010). Commercialization of microfinance in indonesia: The shortage of funds and the linkage program. *Developing Economies*, 48(1), 156-176. doi:10.1111/j.1746-1049.2010.00102.x
- Hartarska, V., Nadolnyak, D., & Mersland, R. (2014). Are women better bankers to the poor? Evidence from rural microfinance institutions. *American Journal of Agricultural Economics*, 96(5), 1291-1306. doi:10.1093/ajae/aau061
- Hartarska, V. M., & Holtmann, M. (2006). An overview of recent developments in the microfinance literature. *Agricultural Finance Review*, 66(2), 147-165. doi:10.1108/00214660680001185
- Hartarska, V., Shen, X., & Mersland, R. (2013). Scale economies and input price elasticities in microfinance institutions. *Journal of Banking and Finance*, 37(1), 118-131. doi:10.1016/j.jbankfin.2012.08.004
- Hartungi, R. (2007). Understanding the success factors of micro-finance institution in a developing country. *International Journal of Social Economics*, 34(6), 388-401. doi:10.1108/03068290710751803
- Hatch, J. K., & Frederick, L. (1998). *Poverty assessment by microfinance institutions: A review of current practice*. Bethesda, MD: Development Alternatives, Incorporated.
- Heath, R., & Jayachandran, S. (2016). *The causes and consequences of increased female education and labor force participation in developing countries*. Cambridge, MA: National Bureau of Economic Research. Retrieved from <https://www.nber.org/papers/w22766.pdf>
- Henley, D., & Boomgaard, P. (Eds.) (2009). *Credit and debt in Indonesia 860-1930: From peonage to pawnshop, from kongsi to cooperative*. Leiden, the Netherlands: KITLV Press.
- Hering, I., & Musshoff, O. (2017). Forewarned is forearmed – repayment delays in microfinance relationships. *Agricultural Finance Review*, 77(2), 218-238. doi:10.1108/AFR-05-2016-0051
- Hermes, N., & Lensink, R. (2007). The empirics of microfinance: What do we know? *Economic Journal*, 117(517), F1-F10. doi:10.1111/j.1468-0297.2007.02013.x
- Hermes, N., Lensink, R., & Meesters, A. (2011). Outreach and efficiency of microfinance institutions. *World Development*, 39(6), 938-948. doi:10.1016/j.worlddev.2009.10.018
- Hermes, N., Lensink, R., & Mehrteab, H. T. (2005). Peer monitoring, social ties and moral hazard in group lending programs: Evidence from Eritrea. *World Development*, 33(1), 149-169. doi:10.1016/j.worlddev.2004.09.001
- Hirth, R. M., & Pestonjee, D. (2016). How group lending affects innovation: Evidence from Ethiopia. *Journal of Developmental Entrepreneurship*, 21(4). doi:10.1142/S1084946716500230
- Hoff, K., Braverman, A., & Stiglitz, J. E. (1993). *The economics of rural organization*. New York: Oxford University Press.
- Hoff, K., & Stiglitz, J. E. (1990). Introduction: Imperfect information and rural credit markets: Puzzles and policy perspectives. *The World Bank Economic Review*, 4(3), 235-250.
- Hossain, S., Galbreath, J., Hasan, M. M., & Randøy, T. (2020). Does competition enhance the double-bottom-line performance of microfinance institutions? *Journal of Banking and Finance*, 113. doi:10.1016/j.jbankfin.2020.105765
- Howe, K. R. (1988). Against the quantitative-qualitative incompatibility thesis or dogmas die hard. *Educational Researcher*, 17(8), 10-16. doi:10.3102/0013189X017008010
- Howson, C. (2013). Adverse incorporation and microfinance among cross-border traders in Senegal. *World Development*, 42(1), 199-208. doi:10.1016/j.worlddev.2012.06.002

- Hu, Q., Chan, S. F., Zhang, G., & Yang, Z. (2016). The joint-liability mechanism: Controlling opportunism through peer monitoring among Chinese supplier groups. *Journal of Business and Industrial Marketing*, 31(5), 640-653. doi:10.1108/JBIM-01-2015-0012
- Huq, B. I. A., Azad, M. A. K., Masum, A. K. M., Wanke, P., & Rahman, M. A. (2017). Examining the trade-off between social outreach and financial efficiency: Evidence from micro-finance institutions in South Asia. *Global Business Review*, 18(3), 617-628. doi:10.1177/0972150917692169
- Husaeni, U. A., & Dew, T. K. (2019). The dynamics of the development of baitul maal wa tamwil in Indonesia with the swot analysis approach. *International Journal of Scientific and Technology Research*, 8(8), 1678-1685.
- Iqbal, S., Nawaz, A., & Ehsan, S. (2019). Financial performance and corporate governance in microfinance: Evidence from Asia. *Journal of Asian Economics*, 60, 1-13. doi:10.1016/j.asieco.2018.10.002
- Isaia, E. (2005). Microfund for women: A case history of microcredit in Jordan. *Savings and Development*, 29(4), 441-468.
- Islam, M. M. U. (1996). Peer monitoring in the credit market. *Journal of Contemporary Asia*, 26(4), 452-465. doi:10.1080/00472339680000271
- Jarungrattanapong, R. (2018). Joint-liability and dynamic incentive mechanisms in microlending: Evidence from lab-in-the-field experiments in Thailand. *Kasetsart Journal of Social Sciences*. doi:10.1016/j.kjss.2018.08.009
- Jeon, D. S., & Menicucci, D. (2011). When is the optimal lending contract in microfinance state non-contingent? *European Economic Review*, 55(5), 720-731. doi:10.1016/j.euroecorev.2010.09.002
- Jiang, M., Mi, Y., & Liu, S. (2014). *Empirical study of identifying the risk customers mode of microcredit: A study based on Guangzhou project*. Paper presented at the WIT Transactions on Information and Communication Technologies.
- Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, 24(4), 602-611. doi:10.2307/2392366
- Johnson, R. B., & Onwuegbuzie, A. J. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133. doi:10.1177/1558689806298224
- Johnson, S. (2009). Microfinance is dead! Long live microfinance! Critical reflections on two decades of microfinance policy and practice. *Enterprise Development and Microfinance*, 20(4), 291-303. doi:10.3362/1755-1986.2009.033
- Juwita, Majid, M. S. A., & Syechalad, M. N. (2018). A dynamic model of non-performing loans of the largest micro-lender in Indonesia. *Journal of Applied Economic Sciences*, 13(5), 1202-1213.
- Kablan, S. (2014). Microfinance efficiency in West African Economic and Monetary Union (WAEMU): Have reforms promoted sustainability or outreach? *Savings and Development*, 38(1), 89-111.
- Kar, A. K. (2013). Mission drift in microfinance: Are the concerns really worrying? Recent cross-country results. *International Review of Applied Economics*, 27(1), 44-60. doi:10.1080/02692171.2012.700701
- Kar, A. K., & Swain, R. B. (2014). Interest rates and financial performance of microfinance institutions: Recent global evidence. *European Journal of Development Research*, 26(1), 87-106. doi:10.1057/ejdr.2013.33
- Katzur, T., & Lensink, R. (2012). Group lending with correlated project outcomes. *Economics Letters*, 117(2), 445-447. doi:10.1016/j.econlet.2012.06.032
- Kenneth, A. (1971). *The theory of discrimination*. Princeton, NJ: Princeton University, Department of Economics, Industrial Relations Section.
- Khanam, D., Parvin, S. S., Mohiuddin, M., Hoque, A., & Su, Z. (2018). Financial sustainability of non-governmental microfinance institutions (MFIs): A cost-efficiency analysis of Brac, Asa, and proshika from Bangladesh. *Review of Economics and Finance*, 12(2), 43-56.

- Khandker, S. R., Khalily, M. B., & Khan, Z. H. (1995). *Grameen Bank: Performance and sustainability* (Vol. 306). Washington DC: World Bank Publications.
- Kodongo, O., & Kendi, L. G. (2013). Individual lending versus group lending: An evaluation with Kenya's microfinance data. *Review of Development Finance*, 3(2), 99-108. doi:10.1016/j.rdf.2013.05.001
- Kritikos, A. S., & Vigenina, D. (2005). Key factors of joint-liability loan contracts an empirical analysis. *Kyklos*, 58(2), 213-238. doi:10.1111/j.0023-5962.2005.00286.x
- Kyereboah-Coleman, A., & Osei, K. A. (2008). Outreach and profitability of microfinance institutions: The role of governance. *Journal of Economic Studies*, 35(3), 236-248. doi:10.1108/01443580810887797
- Ladman, J. R., & Afcha, G. (1990). Group lending: why it failed in Bolivia. *Savings & Development*, 14(4), 353-369.
- Laffont, J.-J., & N'Guessan, T. (2000). Group lending with adverse selection. *European Economic Review*, 44(4), 773-784. doi:10.1016/S0014-2921(99)00041-0
- Lafourcade, A.-L., Isern, J., Mwangi, P., & Brown, M. (2005). *Overview of the outreach and financial performance of microfinance institutions in Africa*. Washington DC: Microfinance Information eXchange. Retrieved from http://www.mixmarket.org/medialibrary/mixmarket/Africa_Data_Study.pdf.
- Lapenu, C. (1998). *Indonesia's rural financial system: The role of the state and private institutions: Case studies in microfinance*. Sustainable Banking with the Poor series. Washington DC: World Bank.
- Lassoued, N. (2017). What drives credit risk of microfinance institutions? International evidence. *International Journal of Managerial Finance*, 13(5), 541-559. doi:10.1108/IJMF-03-2017-0042
- Lebovics, M., Hermes, N., & Hudon, M. (2016). Are financial and social efficiency mutually exclusive? A case study of Vietnamese microfinance institutions. *Annals of Public and Cooperative Economics*, 87(1), 55-77. doi:10.1111/apce.12085
- Ledgerwood, J. (1998). *Microfinance handbook: An institutional and financial perspective*. Washington DC: World Bank Publications.
- Leite, R. D. O., Mendes, L. D. S., & Sacramento, L. C. (2019). To profit or not to profit? Assessing financial sustainability outcomes of microfinance institutions. *International Journal of Finance and Economics*, 24(3), 1287-1299. doi:10.1002/ijfe.1718
- Louis, P., & Baesens, B. (2013). Do for-profit microfinance institutions achieve better financial efficiency and social impact? A generalised estimating equations panel data approach. *Journal of Development Effectiveness*, 5(3), 359-380. doi:10.1080/19439342.2013.822015
- Louis, P., Seret, A., & Baesens, B. (2013). Financial efficiency and social impact of microfinance institutions using self-organizing maps. *World Development*, 46, 197-210. doi:10.1016/j.worlddev.2013.02.006
- Madajewicz, M. (2011). Joint liability versus individual liability in credit contracts. *Journal of Economic Behavior and Organization*, 77(2), 107-123. doi:10.1016/j.jebo.2008.01.007
- Maddala, G. S. (2001). *Introduction to econometrics* (3rd ed.). Chichester, New York: John Wiley.
- Mahmud, M. (2019). Repaying microcredit loans: A natural Experiment on Liability Structure. *Journal of Development Studies*, 56(6), 1161-1176. doi:10.1080/00220388.2019.1632432
- Martowijoyo, S. (2007). *Indonesian microfinance at the crossroads: Caught between popular and populist policies*. Washington DC: Consultative Group to Assist the Poor.

- Masyita, D. (2017). Islamic microfinance institutions in Indonesia and the challenges in the supply chain perspectives. *International Journal of Supply Chain Management*, 6(4), 341-350.
- Maulana, H., Razak, D. A., & Adeyemi, A. A. (2018). Factors influencing behaviour to participate in Islamic microfinance. *International Journal of Islamic and Middle Eastern Finance and Management*, 11(1), 109-130. doi:10.1108/IMEFM-05-2017-0134
- Menard, S. (2010). Logistic regression: From introductory to advanced concepts and applications. Thousand Oaks, California: SAGE Publications, Inc. Retrieved from <https://methods.sagepub.com/book/logistic-regression-from-introductory-to-advanced-concepts-and-applications>. doi:10.4135/9781483348964
- Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA: Jossey-Bass.
- Mersland, R., & Strøm, R. Ø. (2010). Microfinance mission drift? *World Development*, 38(1), 28-36. doi:10.1016/j.worlddev.2009.05.006
- Meyer, J. (2019). Outreach and performance of microfinance institutions: The importance of portfolio yield. *Applied Economics*, 51(27), 2945-2962. doi:10.1080/00036846.2018.1564016
- Mia, M. A., & Chandran, V. G. R. (2016). Measuring financial and social outreach productivity of microfinance institutions in Bangladesh. *Social Indicators Research*, 127(2), 505-527. doi:10.1007/s11205-015-0979-5
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Los Angeles, CA: Sage Publications.
- Miyashita, Y. (2000). Microfinance and poverty alleviation: Lessons from Indonesia's village banking system. *Pacific Rim Law & Policy Journal*, 10(1), 149-189.
- Moechdi, M., Ismail, M., Ananda, C. F., & Yustika, A. E. (2016). Study on empirical characteristic of rural bank sustainability in Indonesia. *International Journal of Monetary Economics and Finance*, 9(4), 363-378. doi:10.1504/IJMEF.2016.080079
- Montgomery, R. (1996). Disciplining or protecting the poor? Avoiding the social costs of peer pressure in micro-credit schemes. *Journal of International Development*, 8(2), 289-305. doi:10.1002/(SICI)1099-1328(199603)8:2<289::AID-JID368>3.0.CO;2-2
- Morduch, J. (2000). The microfinance schism. *World Development*, 28(4), 617-629. doi:10.1016/S0305-750X(99)00151-5
- Morduch, J., Hashemi, S., & Littlefield, E. (2003). *Is microfinance an effective strategy to reach the Millennium Development Goals? CGAP Focus Note, 24*. Washington DC: Consultative Group to Assist the Poor. Retrieved from <https://wagner.nyu.edu/files/faculty/publications/2003-Littlefield-Hashemi-Morduch-Microfinance-and-the-MDGs-CGAP-FN24.pdf>
- Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing Research*, 40(2), 120-123.
- Mosley, P. (1995). "Optimal incentives to repay" in institutions lending to low-income groups: an Indonesian case study. *Savings & Development*, 19(3), 257-278.
- Mukherjee, S., & Bhattacharya, S. (2015). Optimal group size with joint liability group lending strategy. *Indian Growth and Development Review*, 8(1), 2-18. doi:10.1108/IGDR-02-2014-0002
- Mulyati, E., & Harieti, N. (2018). *Model of business activities of microfinance institutions in Indonesia*. Paper presented at the IOP Conference Series: Earth and Environmental Science.
- Murti, G. B., Rokhim, R., & Viverita. (2018). Loan price and size in the Indonesian retail microcredit market. *Pertanika Journal of Social Sciences and Humanities*, 26(August), 139-150.

- Nanayakkara, G. (2017). Interaction and higher order effects of factors affecting the performance of microfinancing institutions. *International Journal of Social Economics*, 44(7), 900-920. doi:10.1108/IJSE-12-2014-0251
- Navajas, S., Conning, J., & Gonzalez-Vega, C. (2003). Lending technologies, competition and consolidation in the market for microfinance in Bolivia. *Journal of International Development*, 15(6), 747-770. doi:10.1002/jid.1024
- Navajas, S., Schreiner, M., Meyer, R. L., Gonzalez-vega, C., & Rodriguez-meza, J. (2000). Microcredit and the poorest of the poor: Theory and evidence from Bolivia. *World Development*, 28(2), 333-346. doi:10.1016/S0305-750X(99)00121-7
- Nazirwan, M. (2015). *The dynamic role and performance of Baitul Maal Wat Tamwil: Islamic community-based microfinance in Central Java* (Unpublished PhD thesis). Victoria University, Melbourne.
- Necesito, N. T. (2016). Testing the portfolio risk in Philippine microfinance institutions. *Asia-Pacific Social Science Review*, 16(1), 32-45.
- Neuman, W. L. (2014). *Social research methods: Qualitative and quantitative approaches* (7th ed.). Harlow, Essex : Pearson.
- Ngo, T. V., Mullineux, A. W., & Ly, A. H. (2014). The impact of scale of operation on financial performance in microfinance. *Eurasian Economic Review*, 4(2), 177-198. doi:10.1007/s40822-014-0011-4
- Nicholson, W. (2002). *Microeconomic theory: Basic principles and extensions* (8th ed.). Independence, KY: South-Western/Thomson Learning.
- Nkwocha, O. U., Hussain, J., El-Gohary, H., Edwards, D., & Ovia, E. (2019). Dynamics of group lending mechanism and the role of group leaders in developing countries: Evidence from Nigeria. *International Journal of Customer Relationship Marketing and Management*, 10(3), 54-71. doi:10.4018/IJCRMM.2019070104
- Noglo, Y., & Androuais, A. (2015). The determinants of group lending repayment performance: Evidence from Togo. *Canadian Journal of Development Studies*, 36(4), 536-554. doi:10.1080/02255189.2015.1046372
- Nwachukwu, J. (2014). Interest rates, target markets and sustainability in microfinance. *Oxford Development Studies*, 42(1), 86-110. doi:10.1080/13600818.2013.827164
- Nwachukwu, J. C., Aziz, A., Tony-Okeke, U., & Asongu, S. A. (2018). The determinants of interest rates in microfinance: Age, scale and organizational charter. *Review of Development Economics*, 22(3), e135-e159. doi:10.1111/rode.12402
- Ohaka, C. C., Chidiebelu, S. A. N. D., Arene, C. J., & Mkpado, M. (2017). Do social capital and membership homogeneity characteristics matter in credit markets with joint-liability among rice farmers groups in Nigeria? *Tropical Agriculture*, 94(3), 295-311.
- Oke, J. T. O., Adeyemo, R., & Agbonlahor, M. U. (2007). An empirical analysis of microcredit repayment in Southwestern Nigeria. *Journal of Human Behavior in the Social Environment*, 16(4), 37-55. doi:10.1300/10911350802081592
- Okten, C., & Osili, U. O. (2004). Social networks and credit access in Indonesia. *World Development*, 32(7), 1225-1246. doi:10.1016/j.worlddev.2004.01.012
- Panjaitan-Drioadisuryo, R. D. M., & Cloud, K. (1999). Gender, self-employment and microcredit programs: An Indonesian case study. *Quarterly Review of Economics and Finance*, 39(5), 769-779.
- Pasila, F. (2019). *Credit scoring modeling of Indonesian micro, small and medium enterprises using neuro-fuzzy Algorithm*. Paper presented at the IEEE International Conference on Fuzzy Systems.
- Pathak, R., & Singla, S. K. (2017). Micro finance and women empowerment - an impact study of self help groups in Punjab. *International Journal of Economic Research*, 14(9), 401-411.
- Pati, A. P. (2017). Transformation and sustainability relationship in Indian microfinance institutions. *International Journal of Services, Economics and Management*, 8(4), 250-267. doi:10.1504/IJSTL.2018.095221

- Pati, A. P. (2019). Market structure and double bottom line commitments: Are they aligned in Indian microfinance industry? *International Journal of Rural Management*, 15(1), 1-22. doi:10.1177/0973005218819664
- Patten, R. H., Rosengard, J. K., & Johnston D.E, Jr. (2001). Microfinance success amidst macroeconomic failure: The experience of bank Rakyat Indonesia during the East Asian crisis. *World Development*, 29(6), 1057-1069. doi:10.1016/S0305-750X(01)00016-X
- Paxton, J. (2003). A poverty outreach index and its application to microfinance. *Economics Bulletin*, 9(2), 1–10.
- Paxton, J., & Thraen, C. (2003). An application of Mean-Covariance Structure Models for the analysis of group lending behavior. *Journal of Policy Modeling*, 25(9), 863-868. doi:10.1016/j.jpolmod.2003.10.002
- Pedrini, M., & Ferri, L. M. (2016). Doing well by returning to the origin. Mission drift, outreach and financial performance of microfinance institutions. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 27(6), 2576-2594. doi:10.1007/s11266-016-9707-2
- Peterson, R. L. (1981). An investigation of sex discrimination in commercial banks' direct consumer lending. *The Bell Journal of Economics*, 12(2), 547-561. doi:10.2307/3003571
- Pham, T., & Talavera, O. (2018). Discrimination, social capital, and financial constraints: The case of Viet Nam. *World Development*, 102, 228-242. doi:10.1016/j.worlddev.2017.10.005
- Plano Clark, V. L., & Creswell, J. W. (2007). *The mixed methods reader*. Thousand Oaks, CA : Sage Publications.
- Purmiyati, A., Berma, M., Talib, B. A., & Rakhima, M. S. (2019). The role of banking capital in industrial sector micro enterprises for poverty alleviation: A study in East Java, Indonesia. *Foundations of Management*, 11(1), 131-142. doi:10.2478/fman-2019-0011
- Quayes, S. (2012). Depth of outreach and financial sustainability of microfinance institutions. *Applied Economics*, 44(26), 3421-3433.
- Quayes, S. (2015). Outreach and performance of microfinance institutions: A panel analysis. *Applied Economics*, 47(18), 1909-1925. doi:10.1080/00036846.2014.1002891
- Quayes, S. (2019). Probability of sustainability and social outreach of microfinance institutions. *Economics Bulletin*, 39(2), 1047-1056.
- Quayes, S., & Khalily, B. (2014). Efficiency of microfinance institutions in Bangladesh. *Economics Bulletin*, 34(3), 1512-1521.
- Raccanello, K. (2014) Women's autonomy and microcredit repayment delay. In D. Wood & P. Berta (Eds.), *Production, consumption, business and the economy: Structural ideals and moral realities (Research in economic anthropology, Vol. 34)* (pp. 293-313). Bingley, UK: Emerald Group Publishing
- Rathore, B. S. (2017). Joint liability in a classic microfinance contract: Review of theory and empirics. *Studies in Economics and Finance*, 34(2), 213-227. doi:10.1108/SEF-02-2016-0040
- Reichert, P. (2018). A meta-analysis examining the nature of trade-offs in microfinance. *Oxford Development Studies*, 46(3), 430-452. doi:10.1080/13600818.2018.1427223
- Reito, F. (2019). Is it better to be mixed in group lending? *Review of Development Economics*, 23(1), 54-71. doi:10.1111/rode.12549
- Rifai, A., Khoon, G. S., & Nyen, W. K. (2019). Advancing rural microfinance through local government: Social commitment and financial sustainability in Riau province of Indonesia. *Journal of Sustainability Science and Management*, 14(6), 117-129.
- Roberts, P. W. (2013). The profit orientation of microfinance institutions and effective interest rates. *World Development*, 41, 120-131. doi:10.1016/j.worlddev.2012.05.022

- Robinson, M. (1995). *The paradigm shift in microfinance: A perspective from HIID. Development discussion paper, 510*. Cambridge, MA: Center for International Development, Harvard University.
- Robinson, M. S., & Fidler, P. J. (2002). *The microfinance revolution: Lessons from Indonesia* (Vol. 2). Washington DC: World Bank Publications.
- Rosenberg, R., Gaul, S., Ford, W., & Tomilova, O. (2013). Microcredit interest rates and their determinants: 2004-2011. In D. Köhn (Ed.), *Microfinance 3.0: Reconciling sustainability with social outreach and responsible delivery* (pp. 69-104). Dordrecht: Springer.
- Saad, M., Taib, H. M., & Bhuiyan, A. B. (2019). Re-evaluating sustainability of microfinance institutions by using topsis. *Humanities and Social Sciences Reviews, 7*(2), 581-589. doi:10.18510/hssr.2019.7269
- Sanyal, P. (2009). From credit to collective action: The role of microfinance in promoting women's social capital and normative influence. *American Sociological Review, 74*(4), 529-550. doi:10.1177/000312240907400402
- Sarwosri, A. W., Römer, U., & Musshoff, O. (2016). Are African female farmers disadvantaged on the microfinance lending market? *Agricultural Finance Review, 76*(4), 477-493. doi:10.1108/AFR-02-2016-0012
- Schmit, L. (1994). *A history of the "Volkscredietwezen" (Popular Credit System) in Indonesia (1895-1935)*. The Hague, Netherlands: Development Cooperation Information Department of the Ministry of Foreign Affairs.
- Schreiner, M. (2002). Aspects of outreach: A framework for discussion of the social benefits of microfinance. *Journal of International Development, 14*(5), 591-603. doi:10.1002/jid.908
- Seibel, H. D., & Parhusip, U. (1998). Attaining outreach with sustainability: A case study of a private micro-finance institution in Indonesia. *IDS Bulletin, 29*(4), 81-90. doi:10.1111/j.1759-5436.1998.mp29004009.x
- Seibel, H. D., Rachmadi, A., & Kusumayakti, D. (2010). Reform, growth and resilience of savings-led commercial microfinance institutions: The case of the microbanking units of bank rakyat Indonesia. *Savings and Development, 34*(3), 277-303.
- Semaw Henock, M. (2019). Financial sustainability and outreach performance of saving and credit cooperatives: The case of Eastern Ethiopia. *Asia Pacific Management Review, 24*(1), 1-9. doi:10.1016/j.apmr.2018.08.001
- Sharma, M., & Zeller, M. (1997). Repayment performance in group-based credit programs in Bangladesh: An empirical analysis. *World Development, 25*(10), 1731-1742. doi:10.1016/S0305-750X(97)00063-6
- Shekh, M. N. I. (2006). Microfinance and poverty reduction: Is there a trade-off? A case study from rural Bangladesh. *Forum for Development Studies, 33*(2), 367-385. doi:10.1080/08039410.2006.9666355
- Sheremenko, G., Escalante, C. L., & Florkowski, W. J. (2017). Financial sustainability and poverty outreach: The case of microfinance institutions in Eastern Europe and Central Asia. *The European Journal of Development Research, 29*(1), 230-245. doi:10.1057/ejdr.2016.12
- Simkhada, N. R. (2018). Approaches and design of microfinance programmes for the ultra-poor in Nepal. *Enterprise Development and Microfinance, 29*(3-4), 276-286. doi:10.3362/1755-1986.00008
- Simtowe, F., Zeller, M., & Phiri, A. (2006). Determinants of moral hazard in microfinance: Empirical evidence from joint liability lending programs in Malawi. *Savings and Development, 30*(SUPPL.), 5-38.
- Simtowe, F., Zeller, M., Phiri, A., & Mburu, J. (2007). Long-run determinants of moral hazard in microfinance: A study of group lending programs from Malawi using panel data. *Quarterly Journal of International Agriculture, 46*(1), 69-84.

- Singh, S. (2015). The effects of microfinance programs on women members in traditional societies. *Gender, Place and Culture*, 22(2), 222-238. doi:10.1080/0966369X.2013.855627
- Sinn, M. (2013). Sequential group lending: A mechanism to raise the repayment rate in microfinance. *Economica*, 80(318), 326-344. doi:10.1111/ecca.12011
- Siregar, H., & Handri, M. (2017). Optimization of group lending-based Village Banking-Saving Loan Association (VB-SLA) financing model: A case study in rattan handicraft industrial center, Medan, Indonesia. *International Journal of Economic Research*, 14(2), 141-152.
- Steckler, A., McLeroy, K. R., Goodman, R. M., Bird, S. T., & McCormick, L. (1992). Toward integrating qualitative and quantitative methods: An introduction. *Health Education Quarterly*, 19(1), 1-8. doi:10.1177/109019819201900101
- Steel, W. F., & Charitonenko, S. (2003). *Implementing the bank's strategy to reach the rural poor*. Washington, DC: Agriculture & Rural Development Department Rural Private Sector, Markets, Finance, and Infrastructure Thematic Group, Report(26030).
- Stiglitz, J. E. (1990). Peer monitoring and credit markets. *World Bank Economic Review*, 4(3), 351-366. doi:10.1093/wber/4.3.351
- Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review*, 71(3), 393-410.
- Strauss, A. L. (1987). *Qualitative analysis for social scientists*. Cambridge, New York: Cambridge University Press.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston : Pearson Education.
- Tambunan, T. T. H. (2017). MSMEs and access to financing in a developing economy: The Indonesian experience. In A. Woldie & B. Thomas (Eds.), *Financial entrepreneurship for economic growth in emerging ations* (pp. 148-172). Hershey, PA: IGI Global.
- Tashakkori, A., Teddlie, C., & Teddlie, C. B. (1998). *Mixed methodology: Combining qualitative and quantitative approaches* (Vol. 46): Sage.
- Tashakkori, A., & Teddlie, C. (2003). *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, CA : SAGE Publications.
- Tchakoute-Tchuigoua, H. (2012). Active risk management and loan contract terms: Evidence from rated microfinance institutions. *Quarterly Review of Economics and Finance*, 52(4), 427-437. doi:10.1016/j.qref.2012.08.001
- Thomas, J. R., & Kumar, J. (2016). Social performance and sustainability of Indian microfinance institutions: An interrogation. *Journal of Sustainable Finance and Investment*, 6(1), 38-50. doi:10.1080/20430795.2015.1124237
- van Bastelaer, T., & Leathers, H. (2006). Trust in lending: Social capital and joint liability seed loans in Southern Zambia. *World Development*, 34(10), 1788-1807. doi:10.1016/j.worlddev.2006.02.007
- Van Tassel, E. (1999). Group lending under asymmetric information. *Journal of Development Economics*, 60(1), 3-25. doi:10.1016/S0304-3878(99)00034-6
- Vanroose, A., & D'Espallier, B. (2013). Do microfinance institutions accomplish their mission? Evidence from the relationship between traditional financial sector development and microfinance institutions' outreach and performance. *Applied Economics*, 45(15), 1965-1982.
- Varian, H. R. (1990). Monitoring agents with other agents. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift Für Die Gesamte Staatswissenschaft*, 146(1), 153-174.
- Velasco, C., & Marconi, R. (2004). Group dynamics, gender and microfinance in Bolivia. *Journal of International Development*, 16(3), 519-528.
- Vigenina, D., & Kritikos, A. S. (2004). The individual micro-lending contract: Is it a better design than joint-liability? Evidence from Georgia. *Economic Systems*, 28(2), 155-176. doi:10.1016/j.ecosys.2004.03.006

- Von Pischke, J. D. (1996). Measuring the trade-off between outreach and sustainability of microenterprise lenders. *Journal of International Development*, 8(2), 225-239.
- Wagona Makoba, J. (2001). Toward the commercialization of microfinance institutions: A global phenomenon. *Journal fur Entwicklungspolitik*, 17(3-4), 353-363.
- Walter, M., & Walter, M. (2013). *Social research methods* (3rd ed.). South Melbourne, Victoria: Oxford University Press.
- Wardhono, A., Modjo, M. I., & Utami, E. W. (2019). Role of credit guarantee for financing MSMEs: Evidence from rural and urban areas in Indonesia. In N. Yoshino & F. Taghizadeh-Hesary (Eds.), *Unlocking SME finance in Asia: Roles of credit rating and credit guarantee schemes* (pp. 187-216). New York; London: Routledge.
- Wediawati, B., Effendi, N., Herwany, A., & Masyita, D. (2018). Sustainability of Islamic microfinance in Indonesia: A holistic approach. *Academy of Strategic Management Journal*, 17(3), 32-45.
- Weiers, R. M., Gray, J. B., & Peters, L. H. (2011). *Introduction to business statistics* (7th ed.). Mason, OH: Thomson South-Western.
- Wenner, M. D. (1995). Group credit: A means to improve information transfer and loan repayment performance. *The Journal of Development Studies*, 32(2), 263-281. doi:10.1080/00220389508422414
- Widiarto, I., & Emrouznejad, A. (2015). Social and financial efficiency of Islamic microfinance institutions: A Data Envelopment Analysis application. *Socio-Economic Planning Sciences*, 50, 1-17. doi:10.1016/j.seps.2014.12.001
- Widiarto, I., Emrouznejad, A., & Anastasakis, L. (2017). Observing choice of loan methods in not-for-profit microfinance using data envelopment analysis. *Expert Systems with Applications*, 82, 278-290. doi:10.1016/j.eswa.2017.03.022
- Wijaya, I. F., Hakim, A. R., Saputro, N., & Mulyadi, M. (2019). Religiosity level and saving decisions in Baitul Maal wat Tamwil: The case of Indonesia. *Journal of Islamic Marketing*. doi:10.1108/JIMA-09-2018-0160
- Wijesiri, M., Viganò, L., & Meoli, M. (2015). Efficiency of microfinance institutions in Sri Lanka: A two-stage double bootstrap DEA approach. *Economic Modelling*, 47, 74-83. doi:10.1016/j.econmod.2015.02.016
- Wijesiri, M., Yaron, J., & Meoli, M. (2017). Assessing the financial and outreach efficiency of microfinance institutions: Do age and size matter? *Journal of Multinational Financial Management*, 40, 63-76. doi:10.1016/j.mulfin.2017.05.004
- Woller, G. (2002). The promise and peril of microfinance commercialization. *Small Enterprise Development*, 13(4), 12-21.
- Wooldridge, J. M. (2006). *Introductory econometrics: A modern approach* (3rd ed.). New York: Thomson.
- World Bank. (1989). *World development report 1989: Financial systems and development*. New York. Retrieved from <https://openknowledge.worldbank.org/handle/10986/5972>
- Worokinasih, S., & Potipiroon, W. (2019). Microfinance repayment performance of SMEs in Indonesia: Examining the roles of social capital and loan credit terms. *Journal of Behavioral Science*, 14(1), 28-45.
- Wrench, J. S., Thomas-Maddox, C., Richmond, V. P., & McCroskey, J. (2013). *Quantitative research methods for communication: A hands-on approach* (2nd ed.). New York: Oxford University Press.
- Wulandari, P. (2019). Enhancing the role of Baitul Maal in giving Qardhul Hassan financing to the poor at the bottom of the economic pyramid: Case study of Baitul Maal wa Tamwil in Indonesia. *Journal of Islamic Accounting and Business Research*, 10(3), 382-391. doi:10.1108/JIABR-01-2017-0005
- Wydick, B. (1999). Can social cohesion be harnessed to repair market failures? Evidence from group lending in Guatemala. *The Economic Journal*, 109(457), 463-475. doi:10.1111/1468-0297.00457

- Wydick, B. (2001). Group lending under dynamic incentives as a borrower discipline device. *Review of Development Economics*, 5(3), 406-420. doi:10.1111/1467-9361.00132
- Xu, S., Copestake, J., & Peng, X. (2016). Microfinance institutions' mission drift in macroeconomic context. *Journal of International Development*, 28(7), 1123-1137. doi:10.1002/jid.3097
- Yang, B., Jialali, P., & Wei, X. (2011). Microfinance in China's poor area and its impact to loan type - Evidence from Xinjiang Uygur Autonomous Region. In *Proceedings of the 2011 Fourth International Conference on Business Intelligence and Financial Engineering* (pp. 486–490). IEEE.
- Yaron, J. (1994). What makes rural finance institutions successful? *The World Bank Research Observer*, 9(1), 49-70.
- Yin, R. K. (2016). *Qualitative research from start to finish* (2nd ed.). New York: Guilford Press.
- Zainal, N., Nassir, A. M., Kamarudin, F., Hook, L. S., Sufian, F., & Hussain, H. I. (2019). Social role of microfinance institutions in poverty eradication: Evidence from ASEAN-5 countries. *International Journal of Innovation, Creativity and Change*, 5(2), 1551-1576.
- Zamore, S. (2018). Should microfinance institutions diversify or focus? A global analysis. *Research in International Business and Finance*, 46, 105-119. doi:10.1016/j.ribaf.2017.12.001
- Zamore, S., Beisland, L. A., & Mersland, R. (2019). Geographic diversification and credit risk in microfinance. *Journal of Banking and Finance*, 109. doi:10.1016/j.jbankfin.2019.105665
- Zhao, G., & Gao, Y. (2011). Group lending: Improving the opportunity of SMEs finance. In *Proceedings of the 2011 International Conference on E-Business and E-Government* (pp. 1-4).

APPENDICES

Appendix 3.1: Literature search on group lending theories.

Database: www.scopus.com

Search location: TITLE, ABSTRACT and KEYWORDS

No	File name	Keywords	Theory
1.	GroupSocialcapital	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("social capital*") AND NOT TITLE-ABS-KEY ("social goal*" OR "social mission*" OR "social objective*" OR "social orientation*")	Social capital
2.	GroupSocialcohesion	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("social cohesion*" OR "social coherent*" OR "social connected*" OR "social tie*") AND NOT TITLE-ABS-KEY ("social goal*" OR "social mission*" OR "social objective*" OR "social orientation*")	Social cohesion
3.	GroupStrategicdefault	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("strategic default*")	Strategic default
4.	GroupTransactioncosts	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("transaction cost*" OR "operation cost*" OR "operational cost*")	Transaction costs
5.	GroupSocialpressure	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("Peer stress*" OR "Peer press*" OR "soci* pressure*" OR "soci* stress*" OR "group press*" OR "group stress*")	Peer pressures
6.	GroupRepaymentschedule	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("*payment plan*" OR "*payment sched*" OR "*payment period*")	Repayment schedule
7.	GroupThreat	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY (threat*)	Threat
8.	GroupPeerselection	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY (assortative* OR pairing* OR mating OR "peer select*" OR "peer screen*")	Assortative matching/mating
9.	GroupPeermonitoring	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("peer monitor*" OR "mutual monitor*")	Peer/mutual monitoring
10.	GroupDynamicincentive	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("dynamic incentive*")	Dynamic incentive
11.	GroupPeerinsurance	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY ("peer insurance*" OR "peer support*" OR "mutual insurance*" OR "mutual support*" OR "group insurance*" OR "group support*")	Peer Insurance Mutual/peer support
12.	GroupSequentiallending	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability") AND TITLE-ABS-KEY (sequent*)	Sequential lending/financing
13.	GroupFreerider	AND TITLE-ABS-KEY ("group lending" OR "group loan*" OR "joint liability")	Free rider Shirking

No	File name	Keywords	Theory
		AND TITLE-ABS-KEY ("free ride*" OR "free-ride*" OR shirk*)	

Synonym search: www.powerthesaurus.org

Appendix 3.2: Literature search on lending methodology, sustainability and outreach.

Database: www.scopus.com

Search location: TITLE, ABSTRACT and KEYWORDS

No	File name	Keywords
1.	MfiGroup 273	TITLE-ABS-KEY (microloan* OR microcredit* OR microfinanc* OR microlend* OR (micro W/2 loan*) OR (micro W/2 credit*) OR (micro W/2 financ*) OR (micro W/2 lend*)) AND TITLE-ABS-KEY ("group lending*" OR "group loan*" OR "joint liabilit*" OR (group W/2 lending*) OR (group W/2 loan*) OR (joint W/2 liabilit*))
2.	MfilIndividual 106	TITLE-ABS-KEY (microloan* OR microcredit* OR microfinanc* OR microlend* OR (micro W/2 loan*) OR (micro W/2 credit*) OR (micro W/2 financ*) OR (micro W/2 lend*)) AND (TITLE-ABS-KEY ("individual lending*" OR "individual liabilit*" OR "individual loan*" OR (individual W/2 lending*) OR (individual W/2 loan*) OR (individual W/2 liabilit*)))
3.	MfiGroupSustainability 52	TITLE-ABS-KEY (microloan* OR microcredit* OR microfinanc* OR microlend* OR (micro W/2 loan*) OR (micro W/2 credit*) OR (micro W/2 financ*) OR (micro W/2 lend*)) AND TITLE-ABS-KEY ("group lending*" OR "group loan*" OR "joint liabilit*" OR (group W/2 lending*) OR (group W/2 loan*) OR (joint W/2 liabilit*)) AND (TITLE-ABS-KEY (*sustainabilit* OR *efficienc* OR *sufficienc* OR *profitab*))
4.	MfiGroupOutreach 26	TITLE-ABS-KEY (microloan* OR microcredit* OR microfinanc* OR microlend* OR (micro W/2 loan*) OR (micro W/2 credit*) OR (micro W/2 financ*) OR (micro W/2 lend*)) AND TITLE-ABS-KEY ("group lending*" OR "group loan*" OR "joint liabilit*" OR (group W/2 lending*) OR (group W/2 loan*) OR (joint W/2 liabilit*)) AND (TITLE-ABS-KEY (*outreach*))
5.	MfilIndividualSustainability 17	TITLE-ABS-KEY (microloan* OR microcredit* OR microfinanc* OR microlend* OR (micro W/2 loan*) OR (micro W/2 credit*) OR (micro W/2 financ*) OR (micro W/2 lend*)) AND (TITLE-ABS-KEY ("individual lending*" OR "individual liabilit*" OR "individual loan*" OR (individual W/2 lending*) OR (individual W/2 loan*) OR (individual W/2 liabilit*))) AND (TITLE-ABS-KEY (*sustainabilit* OR *efficienc* OR *sufficienc* OR *profitab*))
6.	MfilIndividualOutreach 11	TITLE-ABS-KEY (microloan* OR microcredit* OR microfinanc* OR microlend* OR (micro W/2 loan*) OR (micro W/2 credit*) OR (micro W/2 financ*) OR (micro W/2 lend*)) AND (TITLE-ABS-KEY ("individual lending*" OR "individual liabilit*" OR "individual loan*" OR (individual W/2 lending*) OR (individual W/2 loan*) OR (individual W/2 liabilit*))) AND (TITLE-ABS-KEY (*outreach*))

Appendix 4.1: Guideline for Interview of Microfinance's manager



IN-DEPTH INDIVIDUAL INTERVIEW SCHEDULE

OPENING

1. Thank the interviewee for participation
2. Personal introduction: I will introduce myself
3. I explain the purpose of the research which is to generate information concerning about lending practices that participant have knowledge of and experience in his/her daily activities in microfinance institutions.
4. Stress CONFIDENTIALITY and ANONYMITY of the microfinance institution and the participant, and obtain consent to interview and audio-recording.

MAIN TOPICS

1. General information about respondent
 - a. What is your job description?
 - b. Please tell me all your working experience relevant to microfinance institution?
2. Loan products
 - a. What are loan products available in your microfinance institution?
 - b. What are requirements for obtaining the loan (group- and individual-lending)?
3. Borrower screening
 - a. How do you screen borrower creditworthiness (group- and individual-lending)?
 - b. What are the main challenges in the screening process (group- and individual-lending)?
 - c. What are differences in the screening process for individual lending and group lending?
 - d. Does geographic distance significantly influence the screening process (group- and individual-lending)?
 - e. Does technology in communication and information such as mobile phone and internet significantly influence the screening process (group- and individual-lending)?
4. Loan distribution
 - a. How lending decision is made? Individual or collective decision?
 - b. How does a loan distribute to a borrower or a group of borrowers?
5. Monitoring loans
 - a. How do you monitor borrower loan repayment (group- and individual-lending)?
 - b. What are differences in monitoring process for individual lending and group lending?
 - c. Does geographic distance influence the monitoring process (group- and individual-lending)?

- d. Does technology in communication and information such as mobile phone and internet significantly influence the monitoring process (group- and individual-lending)?
6. Loan performance
- a. What is procedure in place if there is repayment problem (group- and individual-lending)?
 - b. Is there any incentive mechanism for good borrower (group- and individual-lending)?

CLOSING

1. (Maintain Rapport) I appreciate the time you took for this interview. Is there anything else you think would be helpful for me to know so that I can fully understand lending practices in your microfinance?
2. (Action to be taken) I should have all the information I need. Would it be alright to call you at home if I have any more questions? Thanks again. I look forward to seeing you in tomorrow FGD session.

Appendix 4.2: Consent Forms



CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a research project conducted by student, Ario, who is student in the College of Business at Victoria University, Australia, as part of a PhD study. The aim of this research is to examine lending practices of microfinance institution and its relation to the achievement of social and financial objectives. One of the data source for this research is based on detailed lending information of sample microfinance institutions in Central Java Province. There are no expected risks because all borrower's identifiers will be removed.

CERTIFICATION BY PARTICIPANT

I, _____ (please write your name)
of _____ (please write the institution name and suburb)

certify that I am at least 18 years old* and that I am voluntarily giving my consent to participate in the study: "Lending Methodologies and the Sustainability, Outreach and Efficiency of Microfinance Institutions in Indonesia" being conducted at Victoria University by: Prof Peter Sheehan, Victoria University, Melbourne, Australia.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by:

Ario

and that I freely consent to participation involving the below mentioned procedures:

- Data extraction from microfinance institution lending records
- The extraction process will be done by the staff of microfinance institutions
- The researcher will receive the data in soft-copy or hard-copy format
- The table format will be provided by the researcher

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed:

Date:

Any queries about your participation in this project may be directed to the researcher
Prof Peter Sheehan
Phone: +61 9919 1341

If you have any queries or complaints about the way you have been treated, you may contact the Ethics Secretary, Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, email Researchethics@vu.edu.au or phone (03) 9919 4781 or 4461.

CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a research project conducted by student, Ario, who is student in the College of Business at Victoria University, Australia, as part of a PhD study. The aim of this research is to examine lending practices of microfinance institution and its relation to the achievement of social and financial objectives. One of the data source for this research is based on interview and Focus Group Discussion (FGD) with credit officers or managers of sample microfinance institutions in Central Java Province about lending methodology and practices in their institutions. There are no expected risks.

CERTIFICATION BY PARTICIPANT

I, _____ (please write your name)
of _____ (please write the institution name and suburb)

certify that I am at least 18 years old* and that I am voluntarily giving my consent to participate in the study: "Lending Methodologies and the Sustainability, Outreach and Efficiency of Microfinance Institutions in Indonesia" being conducted at Victoria University by: Prof Peter Sheehan, Victoria University, Melbourne, Australia.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by:

Ario

and that I freely consent to participation involving the below mentioned procedures:

- Semi-structured interview
- Focus Group Discussion (FGD)
- The interview and FGD will be conducted at a venue outside the microfinance office
- The interview and FGD will be audio-recorded

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed:

Appendix 4.3: Information to Participants



INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

You are invited to participate

You are invited to be a part of a research project entitled "*Lending Methodologies and the Sustainability, Outreach and Efficiency of Microfinance Institutions in Indonesia*" conducted by a student researcher, Ario, who is studying in the College of Business at Victoria University, Australia, as part of his PhD study under the supervision of Prof. Peter Sheehan from the College of Business at Victoria University..

Project explanation

The aim of this research is to examine lending practices of microfinance institution and its relation to the achievement of social and financial objectives. The study will explore current lending practices in Indonesian microfinance institutions particularly in Central Java Province. It will focus on how the current lending practice affects the achievement of social and financial objectives of microfinance institutions. This study is expected to improve the social and financial performance of microfinance institutions specifically in their lending activities.

What will I be asked to do?

You are invited to participate in this research process by answering questions in an interview session and Focus Group Discussion (FGD). The interview will take about one hour and the FGD will take about two hours.

In addition, you are invited to participate by providing loans data excluding identifiers of the borrowers. Table format and the instructions will be provided by the researcher. The data will be collected during the interview session.

What will I gain from participating?

Your contribution is appreciated and your support will benefit this study. The findings of this study will provide important contribution to understanding the issues and the current state of lending practices in Indonesian microfinance institutions and how it influences the social and financial objectives of your microfinance institution. Eventually, it help microfinance institutions in achieving its social objective to reduce poverty.

How will the information I give be used?

Your information for this study will be analysed and used solely for academic purposes. Any data and information will be de-identified and confidential. Your personal identity will not be shown in the thesis or anywhere else.

What are the potential risks of participating in this project?

A potential risk of participating in this research may be discomfort particularly in interview and FGD session. The likelihood of the risk is low because the information asked during the interview and FGD are not related to any personal information of participant. Therefore, this risk may be negligible.

How will this project be conducted?

Data and information of this study will be analysed and used in developing thesis and journal articles, as well as presentation in academic conferences. Nevertheless, the original data and information from the participants will only be accessed by chief investigator, co-investigator and student investigator. Thus, it will be confidential and stored in a secured place. The confidentiality cannot be guaranteed in focus groups discussion.

Who is conducting the study?

The study is being conducted through College of Business, Victoria University, Melbourne, Australia.

Chief Investigator: Prof. Peter Sheehan. Phone: +61 9919 1341. Email: peter.sheehan@vu.edu.au

Student investigator: Ario. Phone: +61452438977. Email: ario.ario@live.vu.edu.au

If you have any queries or complaints about the way you have been treated, you may contact the Research Ethics and Biosafety Manager, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, Vic, 8001 or phone (03) 9919 4148.

Appendix 6.1: Initial capital sources of microfinance

No	MFI	Initial capital
1.	MFI A	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
2.	MFI B	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
3.	MFI C	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
4.	MFI D	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
5.	MFI E	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
6.	MFI F	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
7.	MFI G	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
8.	MFI H	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
9.	MFI I	Local Government grant – Central Java Provincial government <i>Lembaga Kredit Desa (LKD)</i> program
10.	MFI J	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
11.	MFI K	Group member contribution <i>Kelompok Usaha Bersama (KUB)</i>
12.	MFI L	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
13.	MFI M	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
14.	MFI N	Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
15.	MFI O	Cooperative members contribution
16.	MFI P	Local government investment in equity – Central Java Province
17.	MFI Q	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
18.	MFI R	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
19.	MFI S	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program
20.	MFI T	Central Government grant – Ministry of Agriculture <i>Pengembangan Usaha Agribisnis Pedesaan (PUAP)</i> program

Appendix 7.1 Pearson correlation matrix

		INST	TEN	COL	SEX	OCC	LTY	LEM	EDU	CLL	SCR	IRP	ILA	LGR
INST	Pearson Correlation	1	-	-	-	.476**	-	-	.378**	.083**	-	-	.264**	-
	Sig. (2-tailed)		.360**	.168**	.114**	.000	.000	.000	.000	.000	.004	.000	.000	.338**
	N		2238	2238	2238	2238	2238	2238	2238	2238	2238	2238	2238	2238
TEN	Pearson Correlation		1	.023	-	-	.422**	-	-	.118**	.026	.073**	-	.175**
	Sig. (2-tailed)			.277	.000	.000	.000	.000	.000	.000	.215	.001	.000	.291**
	N			2238	2238	2238	2238	2238	2238	2238	2238	2238	2238	2238
COL	Pearson Correlation			1	.003	-	-.019	.079**	.052	.101**	.140**	.059**	.047	.110**
	Sig. (2-tailed)				.886	.002	.367	.000	.014	.000	.000	.005	.025	.000
	N				2238	2238	2238	2238	2238	2238	2238	2238	2238	2238
SEX	Pearson Correlation				1	-	.034	.131**	-	-	.009	-.025	-	.244**
	Sig. (2-tailed)					.261**	.000	.103	.000	.000	.664	.246	.011	.000
	N					2238	2238	2238	2238	2238	2238	2238	2238	2238
OCC	Pearson Correlation					1	-	-	.410**	.201**	-	-	.274**	-
	Sig. (2-tailed)						.322**	.290**	.000	.000	.000	.000	.000	.339**
	N						2238	2238	2238	2238	2238	2238	2238	2238
LTY	Pearson Correlation						1	.223**	-	-	-	.134**	-	.182**
	Sig. (2-tailed)							.000	.000	.000	.000	.000	.000	.000
	N							2238	2238	2238	2238	2238	2238	2238
LEM	Pearson Correlation							1	-	-	-	-.011	-	.075**
	Sig. (2-tailed)								.154**	.210**	.145**	.607	.000	.000
	N								2238	2238	2238	2238	2238	2238
EDU	Pearson Correlation								1	.590**	.221**	-	.473**	-
	Sig. (2-tailed)									.000	.000	.000	.000	.104**
	N									2238	2238	2238	2238	2238
CLL	Pearson Correlation									1	.318**	-	.288**	.174**
	Sig. (2-tailed)										.000	.000	.000	.000
	N										2238	2238	2238	2238
SCR	Pearson Correlation										1	.168**	.081**	.205**
	Sig. (2-tailed)											.000	.000	.000
	N											2238	2238	2238
IRP	Pearson Correlation											1	-	-
	Sig. (2-tailed)												.206**	.115**
	N												2238	2238
ILA	Pearson Correlation												1	-
	Sig. (2-tailed)													.102**
	N													2238

		INST	TEN	COL	SEX	OCC	LTY	LEM	EDU	CLL	SCR	IRP	ILA	LGR
LGR	Pearson Correlation													1
	Sig. (2-tailed)													
	N													

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Appendix 8.1 Summary of hypotheses testing results

No	Hypotheses	Results
1	Loan size (ILA) in individual lending is correlated with the interest rates (IRP)	There is sufficient evidence to reject null hypothesis that the coefficient of variable ILALOG for individual lending is equal to zero. It confirms Hypothesis H1 that loan size (ILA) in individual lending is correlated with the interest rates (IRP).
2	Loan size (ILA) in group lending is correlated with the interest rates (IRP)	There is no sufficient evidence to reject null hypothesis that the coefficient of variable ILALOG for group lending is equal to zero. It cannot confirm Hypothesis H2 that loan size (ILA) in group lending is correlated with the interest rates (IRP).
3	Gender (SEX) in individual lending is associated with interest rates (IRP)	There is sufficient evidence to reject null hypothesis that the coefficient of variable SEX for individual lending is equal to zero. It confirms Hypothesis 3 that gender (SEX) in individual lending is associated with interest rates (IRP).
4	Gender (SEX) in group lending is associated with interest rates (IRP)	There is no sufficient evidence to reject null hypothesis that the coefficient of variable SEX for group lending is equal to zero. It does not confirm Hypothesis 4 that Gender (SEX) in group lending is associated with interest rates (IRP).
5	Loan size (ILA) in individual lending is associated with the likelihood of loan collectability (COL)	There is sufficient evidence to reject null hypothesis that the coefficient of variable ILA for individual lending is equal to zero. It confirms Hypothesis H5 that loan size (ILA) in individual lending is associated with the likelihood of loan collectability (COL).
6	Loan size (ILA) in group lending is associated with the likelihood of loan collectability (COL)	There is no sufficient evidence to reject null hypothesis that the coefficient of variable ILA for group lending is equal to zero. It cannot confirm Hypothesis H6 that loan size (ILA) in group lending is associated with the likelihood of loan collectability (COL).
7	Gender (SEX) in individual lending is associated with the likelihood of loan collectability (COL)	There is sufficient evidence to reject null hypothesis that the coefficient of variable SEX for individual lending is equal to zero. It confirms Hypothesis H7 that gender (SEX) in individual lending is associated with the likelihood of loan collectability (COL).
8	Gender (SEX) in group lending is associated with the likelihood of loan collectability (COL)	There is no sufficient evidence to reject null hypothesis that the coefficient of variable SEX for group lending is equal to zero. It cannot confirm Hypothesis H8 that gender (SEX) in group lending is associated with the likelihood of loan collectability (COL).
9	Lending method (LME) is associated with loan size (ILA)	There is sufficient evidence to reject null hypothesis that the coefficient of variable LME is equal to zero. It confirms H9 that lending method (LME) is associated with loan size (ILA).
10	Gender (SEX) is associated with loan size (ILA)	There is no sufficient evidence to reject null hypothesis that the coefficient of variable SEX is equal to zero.

No	Hypotheses	Results
11	Borrower income (INC) is correlated with loan size (ILA)	<p>It cannot confirm Hypothesis H10 that gender (SEX) is associated with loan size (ILA)</p> <p>There is sufficient evidence to reject null hypothesis that the coefficient of variable INC is equal to zero.</p> <p>It confirms Hypothesis H11 that borrower income (INC) is significant to influence the loan sizes (ILA) at 1% significance level.</p>