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Credit Accessibility: The Impact of Microfinance on Rural Indonesian Households

A thesis
submitted in partial fulfilment
of the requirements for the Degree of
Master of Commerce and Management

at
Lincoln University
by
Danang Budi Santoso

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Abstract

Of a thesis submitted in partial fulfilment of the requirements for
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by

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Microfinance enables rural households to accumulate assets, smooth consumption in time of economic shocks, reduce the vulnerability due to illness, drought and crop failures, and better education, health and housing for the borrower's household. In addition, access to finance may contribute to an improvement in the social and economic position of women participation in family decisions making. Microfinance may have positive spill-over effects such that its impact surpasses the economic and social improvement of the borrower. However, there is still concern whether microfinance performance and outreach eminently reaches the poor household.

This study aims to investigate the credit accessibility and significant characteristics of rural households who are users of microcredit loans versus non-users of microcredit loans. The study also surveys the welfare impact of microfinance on rural households in Indonesia. The study administered a structured questionnaire to 605 rural households in Bantul District, Yogyakarta Province in Indonesia.

Binary Logistic regression is used to investigate credit accessibility of the surveyed respondents. The results reveal that *age of borrowers, household income, interest rates, and loan duration* are key determinants affecting credit accessibility in the surveyed area.

Similarly, binary logistic regression is used to investigate characteristics of the surveyed

respondents, based upon whether they used or did not use microcredit. The empirical results suggest that *age, marital status and education attainment* significantly affect characteristics of clients and non-clients of microfinance. The multinomial logit model (MNL) is used to assess the welfare impacts of microcredit in term of households income, monthly expenditure and total assets of borrowers. In term of the borrowers income, the MNL shows that *age of borrowers, monthly expenditure and occupation* are significant factors influencing the increase in income of the borrowers after they have accessed microcredit. In term of borrower's total assets, the MNL model reveals that more highly educated borrowers are more likely to increase their total assets after accessing microcredit. The MNL model also reveals that only expenditure per month of borrowers has a positive correlation with the increase of welfare impacts of the clients' expenditures.

Key words: microfinance, poverty, Indonesia, logit model, multinomial logit model

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Abbreviation

Askrindo	Asuransi Kredit Indonesia
BI	Bank Indonesia
BKD	Badan Kredit Desa
BMT	Baitul Maal wa Tamwil
BPR	Bank Perkreditan Rakyat
BRI	Bank Rakyat Indonesia
CSR	Corporate Social Responsibility
DID	Different-in-Difference
FI	Financial institutions
IIA	Independence Irrelevant Assumption
IDR	Indonesian Rupiah
Jamkrindo	Jaminan Kredit Indonesia
KUR	Kredit Usaha Rakyat
OJK	Otoritas Jasa Keuangan
OLS	Ordinary Least Square
MFIs	Microfinance Institutions
MNL	Multinomial Logit Model
MSMEs	Micro, Small and Medium Enterprises
PNPM	Program Nasional Pemberdayaan Masyarakat
RRC	Rural Credit Cooperative
RRR	Relative Risk Ratio
RSE	Robust Standard Error

Chapter 1

INTRODUCTION

1.1 Rationale of the Study

The world has been encouraged by the socio-economic impacts of microfinance on poverty alleviation, most notably in less-developed countries. A microfinance institution (MFI) is described by Getubig and Gibbons (2000) as the provision of intermediation by a financial organization through the distribution of small loans, the acceptance of small savings and the provision of other financial products and services to the poor. The main objective of microfinance is to effectively and deliberately reduce or eliminate poverty within in a reasonable time by providing the poor with access to microcredit (Remenyi, 2000). In this regard, poor households are treated as potential borrowers in such a way that they are able to set up their own small businesses and could then escape from the poverty trap.

In contrast, conventional banks have some of the most stringent requirements when they deal with the underserved/poor groups who lack collateral and exhibit poor credit-worthiness, those sometimes known as “un-bankable.” Thus, formal financial institutions (FIs), such as commercial banks and rural banks, which traditionally serve banks’ clients, are reluctant to serve the poor mainly because they fail to meet the selection criteria, such as the physical collateral set by the financial institutions (Li, et al., 2011a).

Amidst worrying reports about poor households who live under the poverty line¹, microfinance programmes for poverty alleviation has been burgeoning in developing countries, such as in Bolivia, Bangladesh and Indonesia. The microfinance development by building a set of inclusive financial institutions, has raised the hope that much poverty can be alleviated. As a result, economic and social structures can be transformed at the grass root level by providing financial services to low-income households (Morduch, 1999).

As Hermes and Lensink (2011) have argued, access to finance may contribute to long-lasting increases in income from a rise of investment in income-generating activities and a possible diversification of sources of income for low-income groups, particularly rural households.

Microfinance enables rural households to accumulate assets, smooths consumption in times of economic shocks, reduces their vulnerability due to illness, drought and crop failures, and achieves better education, health and housing outcomes for the borrowers' households. In addition, access to finance may contribute to an improvement in the social and economic position of women in family decision-making. Microfinance may also have positive spill-over effects as its impact surpasses just the economic and social improvement of the borrowers. For example, microcredit borrowers are likely to obtain higher incomes per capita and other social security protection, such as better education, health and housing. Furthermore, the positive assessment that microfinance contributions help to reduce poverty has convinced many governments, NGOs, and individuals to support the development MFIs and their

¹ Based on the World Bank definition, the poverty line is defined as people who are living on less than \$1.90 a day at 2015 international prices (purchasing power parity / PPP).

Source: <http://data.worldbank.org>

activities (see for example, Hermes and Lensink, 2011; Md Saad and Duasa, 2009; Morduch, 1998).

The success story of microfinance cannot ignore the impact from the Grameen Bank in Bangladesh since its establishment in 1970's. The bank was founded by Dr. Muhammad Yunus because of his passion for helping poor people, especially women, by providing small and soft loans from his own pocket to enable those villagers to buy materials for projects such as bamboo weaving and producing pots. In recognition of his innovation, he was awarded the Nobel Peace Prize in 2006 (Johnston and Morduch, 2008). The Grameen Bank practice is to use a "group lending" and "joint liability" scheme. It was Yunus's idea that before borrowers receive loans, they should voluntarily form a group. Albeit the microcredit loans are made individually, all members of the group would be responsible for the loan repayments. The groups consist of five borrowers; the first two receive loans, then to the next two, and then the fifth borrower. These groups of five members meet weekly with seven other groups, so bank staff will thus meet with forty clients at a time. According to the rules, if one member defaults, all members in the group are denied subsequent loans (Morduch, 1999).

Several empirical studies have been conducted to measure the potential impacts of microfinance on reducing poverty in Bangladesh. Morduch (1998) pointed out that potential impact of microfinance are associated with reduction of households vulnerability by offering ways of smoothing consumption and smoothing income to rural households. In addition, Pitt and Khandker (1998) estimated that microfinance programmes have significantly influenced the welfare of rural borrowers in terms of household expenditure, non-land

assets, labor supply and children schooling in Bangladesh. Furthermore, Rahman and Ahmad (2010) found that microcredit provided to the agricultural and rural sectors significantly increased household income, production of crops and livestock, expenditure and employment.

1.2 Problem Statement

Indonesia has a population of about 250 million people and is considered a lower middle-income country, with 17.4% of the population regarded as poor (31.2 million)². About 214 million people (20%) still depend on micro and small-scale businesses for their living, but only 10 million of the 42 million microenterprises have access to credit from formal financial institutions (Banking With The Poor, 2013). A survey conducted in 2002 found that 40% of poor households were judged to be creditworthy based on the criteria of loan officers, but fewer than 10% of poor households had borrowed from a formal micro-bank (Johnston and Morduch, 2008).

The 1997 Asian financial crisis also affected Indonesian financial sectors. The central banks of affected Asian countries were not immune from the crisis, and tried to mitigate the risk of future bank failures by promulgating a series of regulatory reforms. Inevitably, these reforms also changed Indonesian's microfinance outlook, which became larger and centralised by re-regulations to amalgamate relatively small, community-based financial institutions which were considered suspicious and hostile (Rosengard, et al., 2007). According to Rosengard, et al. (2007), financial reforms in Indonesia have concentrated on the default banks rather than mitigating banking risks and decreasing the access of low-income households and

² Source : World Bank Data - <http://data.worldbank.org/country/indonesia>

enterprises to formal financial services, especially in rural areas. Furthermore, the Indonesian government has also weakened incentives for innovation and outreach at the micro-banking level. The policy makers have concentrated credit risk by standardising the banking system such as establishing mandatory village MFIs and converting government MFIs to the People Credit's Bank (BPR), weakening or severance of provincial government oversight and technical support by the provincial government, the centralisation of operations, and a preference for standard loan products and delivery systems (Rosengard and Prasetyantoko, 2011).

Rosengard and Prasetyantoko (2011) have argued that the financial sectors in Indonesia are currently characterised by two perplexing paradoxes:

1. Indonesian microfinance institutions have been successful in their outreach and innovation for the past 25 years, but accessibility to microfinance services is an on-going problem for many poor households.
2. Indonesia's commercial banks are regarded as liquid, solvent, and profitable, and the Indonesian economy has been doing reasonably well over the past decade, but small and medium enterprises (SMEs) face a credit crunch.

Based on the current problems of credit accessibility to Indonesian rural households, this study aims to investigate the credit accessibility and welfare impact of MFIs on rural households in Indonesia. Moreover, Indonesia is still improving to become middle incomes country. However, heavily prevalence of poverty in the rural areas and lacking access of formal and informal credit to rural households has been considered as hurdles in improving the livelihood for rural households.

1.3 Purposes of the study

To address the aforementioned research problems, there are four research questions as follows:

1. What are the determinants of credit accessibility to rural households in Indonesia?
2. What are the welfare impacts of microfinance (and microcredit) on rural households in Indonesia?
3. What are the characteristics of rural household members who use microcredit loans versus those who do not use microcredit loans in Indonesia?
4. What are the best practices of microfinance programmes for the policy decision makers?

1.4 Contributions of the Study

There will be three contributions from the current study. First, the study will identify the determinants affecting microcredit accessibility of rural households in Indonesia. Secondly, to the best of our knowledge, there have been few empirical studies (see for instance, Arsyad, 2005; Hawariyuni, et al., 2014; Prawiranata, 2013; Tsukada, et al., 2010), that have assessed welfare impacts of microfinance on Indonesian rural households. Therefore, this study will bridge the gap in the Indonesian microfinance literature by using an empirical approach comprising a field survey and a structured questionnaire. Finally, this study will propose some policy recommendations for Indonesian policy makers that may yield better strategies to help expand their microcredit outreach to rural households.

1.5 Thesis Outline

The study consists of five chapters. Chapter One provides the rationale of the study, the problem statements, the objectives of the study, and contribution of the study. Chapter Two details the literature review. This chapter comprises of a general definition of microfinance, characteristics and history of Indonesian microfinance, microcredit accessibility in Indonesia, factors influencing credit accessibility and the determinants of welfare impacts of microcredit. Chapter Three explains the empirical models used to answer each of the research objectives. This is followed by the data collection procedures, the sampling and survey design. Chapter Four details the descriptive statistics and regression results for the three empirical models. Finally, Chapter Five summarises of the main research findings, proposes policy recommendations, gives the limitations of the study and provides suggestions for future research.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

Chapter two provides an extensive overview on the development of microfinance and the characteristics of Indonesian microfinance institutions. This chapter also explores the problems of credit accessibility in rural areas in Indonesia. The determinants of rural household's characteristics which determine their access to credit will also be discussed. And finally, the empirical theories supporting factors influencing welfare impact of microfinance are also detailed.

2.2 Definitions of Microfinance

There has been a development of a range of terms for defining microfinance in the literature recently. Given the achievement of microfinance as a prominent tool in poverty alleviation, the literature has defined microfinance as follows:

Ledgerwood (1998) argued that microfinance is the provision of financial services to low income clients, including small traders, street vendors, small farmers, service providers (e.g; hairdressers, rickshaw drivers), artisans and small producers. Similarly, Mersland and Strøm (2008) state that microfinance provides financial services on a micro scale, such as microcredit, micro insurance, and micro savings for poor and low income people.

Meanwhile, Robinson (2002) proposes a broad definition of microfinance, which refers to small scale financial services, primarily credit and savings, provided to people who farm or fish or herd; who operate small enterprises or small business enterprises where goods are produced, recycled, repaired, or sold; provide small services, who work for wages and

commissions; gain income from renting agricultural machinery to other individuals and groups at the local level in both rural and urban areas.

In Indonesia, microfinance institutions are regulated by the government. The definition of microfinance institutions was enacted by Law Number 1 Year 2013 which states that microfinance “ is a financial institution that is specifically established to provide business development services and community development, either through loans or by financing micro enterprises, to members and the public, the management of deposits, as well as the provision of consulting services for business development, not only profit-oriented but also socially-oriented enterprises”. According to the law, MFIs in Indonesia include two types of microfinance, namely: 1) Cooperatives and limited liability companies. The microfinance institutions as cooperative legal institutions are supervised and regulated by the Ministry of Cooperative and Small Medium Enterprises; and 2) other non-bank financial institutions that are governed by the Ministry of Law and Human Rights (see Table 2.1). Furthermore, the Indonesian Financial Authority (OJK) advises that microcredit providers should focus their microcredit programmes or services on the unmet credit demands which, in a large part, have been served by commercial bank or formal Financial Institutions (FIs).

2.3 Characteristics and History of Microfinance in Indonesia

The development of Indonesian microfinance can be traced back to the establishment of the *Purwokerto Support and Savings Bank for Netherlands Indies Civil Servants* in 1895 as the origin of Bank Rakyat Indonesia (BRI), the largest microcredit provider in Indonesia.

Historically, Indonesian microfinance was initiated to protect poor and indigenous people

against the practices of money-lenders and pawn-brokers, carried out mostly by the Chinese and Arabs (Robinson, 2002).

There are two major institutional providers of MFIs services in rural areas: the government-owned Bank Rakyat Indonesia (BRI), with some 3,500 sub-branches (unit desa) at the sub-district level, and some 9,000 formal and semi-formal MFIs (Seibel and Parhusip, 1998).

Based on Prawiranata (2013) and the Banking With The Poor (2013), the types of MFIs in Indonesia can be categorised as banks and non-banks (see Table 2.1).

Table 2-1: Types of Microfinance Institutions (MFIs) in Indonesia

Category	Banks		Non-Banks	
	Conventional	Islamic	Conventional	Islamic
State owned banks or Cooperatives	<p>1. State-owned Banks: - Based on Act No. 10/1998 - Government shares - Supervised by Financial Authority Service (OJK)</p> <p><u>Example:</u> - BRI Units - Mandiri Bank - BTN</p>	<p>1. State Owned Banks: - Based on Act No. 10/1998 - Government shares - Supervised by Financial Authority Service (OJK)</p> <p><u>Example:</u> - BRI Syariah - Mandiri Syariah - BTN Syariah</p>	<p>1. Cooperatives: Based on Cooperatives Act No. 25/1992 Supervised by Ministry of Cooperatives and MSME's</p> <p><u>Example:</u> - Koperasi Simpan Pinjam</p>	<p>1. Islamic Cooperatives: Based on Cooperatives Act No. 25/1992 Supervised by Ministry of Cooperatives and MSMEs</p> <p><u>Example:</u> - Baitul Maal wa Tamwil (BMT)</p>
Commercial Banks or Non-formal MFIs	<p>2. Commercial Banks - Based on Act No. 10/1998 - Private companies - Supervised by Financial Authority Service (OJK)</p> <p><u>Example:</u> - Danamon Simpan Pinjam - BTPN</p>	<p>2. Islamic Commercial Banks - Based on Act No. 10/1998 - Private companies - Supervised by Financial Authority Service (OJK)</p> <p><u>Example:</u> - Danamon Syariah - BTPN Syariah</p>	<p>2. Pawnshops Divided into: a. State-owned: Perum Pegadaian (PP) b. Private Pawnshops</p>	n/a*

Rural Banks or Non-formal MFIs	<p>3. Rural Banks:</p> <ul style="list-style-type: none"> - Based on Act No. 10/1998 - Private companies - Supervised by Financial Authority Service (OJK) - Coverage area: district level/municipal <p><u>Example:</u></p> <ul style="list-style-type: none"> - Bank Perkreditan Rakyat (BPR)/Rural Conventional Banks - Village Funds and Credit Institutions (Badan Kredit Desa) 	<p>3. Islamic Rural Banks:</p> <ul style="list-style-type: none"> - Based on Act No. 10/1998 - Private companies - Supervised by Financial Authority Service (OJK) - Coverage area: district level/municipal <p><u>Example:</u></p> <p>BPR Syariah</p>	<p>3. Money-lenders, Arisan (self-help group):</p> <p>They are not regulated by the government and charge very high interest rates for borrowers.</p>	n/a
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* n/a: not available

Source: Adapted from Prawiranata (2013)

Indonesian MFIs mostly target rural households as their clients. Furthermore, the MFIs' clients are usually micro, small and medium enterprises (MSMEs) who need to access MFIs, which offer microcredit to MSMEs to carry out their small businesses. In addition, MSMEs that lack working capital seek loanable funds to invest in profitable self-employment, small enterprise projects, or to purchase inputs for agricultural production. Table 2.2 depicts the growth of microcredit outstanding accessed by Indonesian MSMEs.

Table 2-2: Total Credit Outstanding of Micro, Small and Medium Enterprises/MSMEs (Billion IDR)

Outstanding	2011	2012	2013	2014
MSMEs Credits	479,886.5	552,226.1	640,034.5	666,639.7
Non MSMEs Credits	1,779,975.9	2,226,731.2	2,742,838.8	2,826,504.7
Total of National Credits	2,259,862.4	2,778,957.3	3,382,873.4	3,493,144.4
<i>% Microcredit of Total National Credits</i>	<i>21.24%</i>	<i>19.87%</i>	<i>18.92%</i>	<i>19.08%</i>
Number of Accounts	8,797,888.0	9,078,322.0	10,139,606.0	10,476,013.0

Data Source: Bank Indonesia (MSMEs Development Group - Financial Access and MSME Development), as of December 2014

The progress of microcredit for MSMEs in Indonesia has increased considerably, by 38.9% in the last four years. Table 2.2 shows that MSMEs' outstanding microcredit has increased, from IDR³ 479,886 billion in 2011, to IDR 666,639 billion in 2014. The achievement of microcredit outreach in Indonesia began after the central bank issued regulations to support MSMEs financing by giving a mandate that 20% of the banks' portfolios should be gradually lent to the MSME sector mandated increase were from 5% in 2015, to 10% in 2016, 15% in 2017, and 20% in 2018 (Bank Indonesia, 2014). Another reason for the increasing use of microcredit was the launching of the government-subsidised microcredit programme of Kredit Usaha Rakyat (KUR) in 2008, which was supported by major state-owned commercial banks and regional banks. However, microcredit to the MSMEs sector also dropped slightly, from 21.24 % in 2011 to 19.08 % in 2014. This is because of competition in interest rates and the prevalence of high operational costs for microfinance in Indonesia (Winosa, 2014). As a result, due to the high interest rates among microcredit providers in Indonesia, rural households were inhibited from participating in microcredit programmes.

The data in Table 2.3 shows that there is a gap in microcredit accessibility for the MSMEs sector compared to the total outstanding national credit.

³ IDR : Indonesian Rupiah, as per 31 Dec 2014 1 NZD = 9719.16 IDR

Table 2-3: Microcredit for MSMEs served by formal MFIs (in billion rupiah)

No	Outstanding	2011		2012		2013		2014*	
1	State Owned Banks	222,645.1	46.4%	242,861.1	44.0%	304,750.6	47.6%	311,148.5	46.7%
2	Foreign Exchange Private National Banks	176,924.8	36.9%	205,731.2	37.3%	217,529.4	34.0%	231,211.1	34.7%
3	Non-foreign Exchange Private National Banks	17,308.8	3.6%	23,259.7	4.2%	27,571.6	4.3%	28,920.4	4.3%
4	Regional Development Bank	31,313.9	6.5%	45,081.8	8.2%	46,895.9	7.3%	48,145.5	7.2%
5	Joint Venture Banks	6,651.3	1.4%	8,750.1	1.6%	11,378.7	1.8%	11,963.1	1.8%
6	Foreign Owned Bank	3,320.0	0.7%	712.6	0.1%	697.1	0.1%	4,040.0	0.6%
7	Conventional Rural Banks/Islamic Rural Banks (BPR/BPR Syariah)	21,722.5	4.5%	25,829.5	4.7%	31,211.1	4.9%	31,211.1	4.7%
	Total of MSMEs Outstanding Credit	479,886.4	100%	552,226.0	100%	640,034.4	100%	666,639.7	100%

Data Source: Bank Indonesia (MSMEs Development Group - Financial Access and MSME Development), as December 2014

Table 2.3 shows that state-owned banks have become the predominant leaders in providing microcredit to MSMEs in Indonesia, and they comprised 46.7% of total loans outstanding by MSMEs in 2014.

One of the state-owned banks which predominantly serves micro-lending to rural households in Indonesia is Bank Rakyat Indonesia (BRI). By December 2014, BRI has taken the lead in distributing microcredit to the majority of Indonesia rural households seeking loans with a total outstanding value of IDR 24.038 trillion (distributed to more than 11.326 million clients⁴). In other words, BRI has become the largest microcredit provider in Indonesia.

However, there are also several types of MFIs that cater to microcredit for rural households in Indonesia (see Table 2.1). Those MFIs comprise formal, semi-formal and informal financial institutions that have been operating in the rural areas as providers of microcredit. Arsyad

⁴ Data from <http://komite-kur.com/article-103-sebaran-penyaluran-kr-redit-usaha-rakyat-periode-november-2007-november-2014.asp>

(2005, p. 67) states that a formal financial institution comprises of “a financial institution that is governed by the Indonesian Government, and subject to regulation and supervision by the State”; while the informal financial institution comprises of “intermediaries that operates outside the framework of government regulation and supervision”. In addition, the author argued that between the two forms, semiformal MFIs are microcredit providers that are not regulated by banking authorities but are registered and/or licensed by other authorities or regional governments, such as the Ministry of Cooperative and MSMEs and provincial governments (Arsyad, 2005).

2.4 Microcredit Accessibility in Indonesian Rural Households

Despite the longevity of the existence of microfinance and outreach, Indonesia MFIs have been facing obstacles in catering for microcredit, particularly to rural households who still live under the poverty line. One of the reasons for these obstacles is due to the heterogeneous type of MFIs and the fragmentation and legislation of microcredit institutions in developing countries, including Indonesia (Seibel and Rachmadi, 2009). Apart from conventional financial institutions, who act as formal FIs, such as commercial banks (public and private), there are also many semi-formal MFIs which provide microcredit to rural borrowers. These are cooperatives, money-lenders and pawn-shops. These MFIs are supervised and governed by different government agencies. According to Indonesian Banking Laws (No. 7 / 1992 - superseded by Law No. 10 / 1998), there are two types of formal banking-institutions serving microfinance. First, there are commercial banks such as BRI Unit, Bank Mandiri, and Bank Pembangunan Daerah (BPD), which cater for microcredit in unit divisions with nationwide coverage area. The second type comprises of rural banks such as Bank Perkreditan Rakyat (BPR) with a major focus on microcredit services to rural

households in the district level. Both commercial and rural banks serve microcredit to rural households⁵. On the other hand, cooperatives as semi-formal FIs, are overseen under the supervision of the Ministry of Small Medium and Enterprises (Law No. 25/1992).

Furthermore, although Indonesia has been a global leader in microfinance outreach and innovation for the past 25 years, accessibility to microcredit services by the poor is declining (Rosengard and Prasetyantoko, 2011).

The lack of financial services to Indonesia rural households has become a major concern to policy makers. In 2009, the World Bank reported in one of their surveys on Indonesia Rural Households Access to financial services that:

- Around half of Indonesian rural households have access to formal financial institutions (more than 50% have savings accounts, especially with commercial banks) while one third do not have access to either formal or informal FIs.
- Fewer than 20% of the Indonesian people have been granted loans from formal banks, with 33% gaining loans from informal financial institutions. Surprisingly, 40% have never had access to credit, with a majority of the population residing in the rural area (WorldBank, 2009).

This World Bank survey also revealed that the constraints of rural households in accessing finance comprise of a lack of collateral, inadequate identification and documentation, insufficient income and heavy indebtedness.

⁵ Source: www.bi.go.id

In addition, Tambunan (2015) found that a lack of capital is the key constraint facing rural households who operate microenterprises. Moreover, the author argues that the lack of capital is mainly due to the lack of access to banks and other formal non-bank financial institutions. Tsukada, et al. (2010), in a study of rural bank practices in East Java Province, have also argued that the poorest households have a relatively lower probability of exploring new credit opportunities than middle-income households, even if the credit scale was very small. Miyata and Sawada (2006) also recognised that credit barriers acted as serious constraints for rural households in adopting new floating net aquaculture technology. In other words, as Miyata and Sawada pointed out, without sufficient capital poor households cannot implement new technology for their income generating activities.

2.5 Determinants of Credit Accessibility

Based on previous studies (see for instance, Evans, et al., 1999; Vaessen, 2001), several household determinants hinder rural households from accessing microcredit. Those determinants can be categorised into two broad dimensions: institutional (banks or MFIs) barriers and clients/borrowers barriers. Further, Vaessen (2001) pointed out that rural households' access to credit became a discussion between the characteristics of the supply side (microcredit providers) versus the characteristics of the demand side (microcredit borrowers). The next section will explore some factors that affect rural household access to microcredit.

1. Gender of Clients

Women's participation in the microfinance programme has become the key determinant of some empirical studies in several developing countries, such as in Bangladesh, (Pitt and

Khandker, 1998), and in Indonesia (Hawariyuni, et al., 2014). The reason is that female borrowers are proven to have higher repayment rates than male counterparts. As a result, women are preferable credit borrowers by MFIs. Pitt and Khandker (1998) found that microcredit program has larger effects on the behaviour of poor households in Bangladesh if women are the credit participants. Moreover, the study found that annual household consumption expenditure increases 18 taka for every 100 additional taka borrowed by women from these credit programs, compared with 11 taka for men (Pitt and Khandker, 1998).

However, a study conducted in China shows that women have been credit-rationed when participating in the institutional rural credit market (Li, et al., 2011a). The authors' results suggested that poor rural households, especially when headed by women, in China have limited access to institutional credit, including the microcredit market provided by Rural Credit Cooperatives (RCC). This finding was supported by Kashuliza and Kydd's (1996) research which disclosed a lower rate for women participating in microcredit than in other developing countries. Kashuliza and Kydd (1996) discovered that female-headed household farmers were relatively rationed from formal rural credit programmes due to the prevailing social and cultural constraints in rural areas of Tanzania. Evans, et al. (1999) indicated the disadvantaged status of female-headed household clients compared to male borrowers in Bangladesh. In contrast, Okten and Osili (2004) found that females are more likely to be granted microcredit in Indonesia. This is quite surprising since the role of women is limited in many parts of Indonesia. Even so, the authors argued that women benefit from participating in community networks which resulted in their higher probability to access microcredit. Churchill (1999) and Tang, et al. (2010) showed similar results on gender determinants in the

likelihood of credit participation. Churchill (1999) stated that lenders preferred to make grants to female borrowers because of their lower default rates, reasoning that in some cultures, women are more apt to participate in collective activities (group-lending) than men. A recent study in China by Tang, et al. (2010) suggests that female-headed households are more likely to borrow and the probability increases by 11% from the informal credit market since women have lower status by which to access microcredit.

2. Age of borrowers

Demographic factors in terms of the age of the borrower are commonly used in most microfinance empirical studies (see for instance, Mohamed, 2003; Nouman, et al., 2013; Tsukada, et al., 2010). However, results of some studies show a non-significant correlation of the borrowers' age to the probability of obtaining credit (Li, et al., 2011a; Tsukada, et al., 2010; Vaessen, 2001). Evidence from a household panel data survey by Tsukada, et al. (2010) using mixed probit analysis of household credit choices revealed that the age of microcredit borrowers is positive related to but not significant for all choices of rural credit (formal and informal credit providers) in Indonesia. Similar results by Vaessen (2001) in terms of age determinant showed that Northern Nicaraguan microfinance programmes did not differentiate credit accessibility between older or younger clients. Additionally, Li, et al. (2011a) also found a positive but non-significant relationship between age of borrowers and microcredit accessibility in China.

Interestingly, Tang, et al. (2010) studied the effect of age determinant and found a significant and positive result on rural credit markets in China. As a result, the authors suggested that older farmers are more likely to borrow from segmented microcredit

providers. Tang, et al. argued that older farmers have more extensive social networks or greater social capital. Hence, they can easily access credit, either formal or informal. Tang, et.al's result is similar to Okurut (2006)'s study in South Africa, which compared households' panel data in 1995 and 2000. At the national level, access to microcredit providers by rural households was positive and significantly determined by the age of the borrowers (Okurut, 2006).

3. Household Size

Having more children in the family is assumed to be a credit constraint. The reason for this is that poor rural households, who have larger families, struggle to fulfil their daily cash requirements instead of meeting their regular loan repayments, as they are bound by the microcredit loans they borrowed (Okurut, 2006). This condition is common in developing countries such as India, Bangladesh, Indonesia and China. Moreover, Okurut argued that the determinant of household size is positive and significantly influenced credit accessibility during two periods of national assessments in South. The author's results suggest that rural households have a greater ability to access credit in rural South Africa.

A similar result was also discovered in India, which showed that household size was statistically significant for rural client's access to the rural credit market (Sarap, 1990).

Sarap's study revealed that larger family size increased the demand for credit by shifting the household's resources in favour of their agricultural activities. Conversely, Sarap's result contradicted Sebopetji and Belete's study in South Africa, which revealed that there was negative and non-significant correlation between household size and credit access.

Furthermore, the authors argued that farmers with larger families are more likely to be credit rationed (Sebopetji and Belete, 2009).

4. Networks and Recommendations

One of the determinants influencing credit access by rural households is the availability of networks and recommendations to financial institutions. Vaessen (2001) has argued that local networks for information and recommendations are important low-cost screening mechanisms for rural banks. More pointedly, in the view of the demand side, households' capacity in terms of their willingness to borrow from MFIs, clients' networking and recommendations to bank staff and from current borrowers significantly influenced the probability of having access to a microcredit provider in Northern Nicaragua (Vaessen, 2001). Vaessen's result is similar to Okten and Osili (2004) study in Indonesia which showed the importance of community networks as a factor in enhancing the probability to access microcredit.

In measuring the effect of network variables to credit accessibility, Okten and Osili suggested that women's participation and economically active siblings positively and significantly affect the probability of obtaining microcredit in Indonesia where social networks play an important role in the credit application process. Coleman (2006) found that public information on land holdings and local information on creditworthiness are used as screening tools to select village-bank members. Behr, et al. (2011) argued that bank and borrower relationships have been investigated as a key determinant influencing the likelihood of being granted credit in rural households in Mozambique. The authors showed that the relationship intensity between credit providers and their clients had a positive and

significant correlation with credit approval. This implies that the more intense the relationship between the village banks and their clients the easier it is for borrowers to get credit approval (Behr, et al., 2011).

5. Educational Attainment

The education of borrowers was also found to be a significant factor in most of the studies, such as those of Vaessen (2001), Li, et al. (2011a) and Evans, et al. (1999), who investigated microcredit services in several countries. Their studies showed that rural borrowers who had obtained better education are more likely to become clients of MFIs. In other words, a lack of education will constrain rural households from participating in the microcredit programmes. Evans, et al. (1999) studied the participation of women borrowers in microcredit programmes in Bangladesh. They found that membership in a Bangladeshi microfinance programme was 3.9 times more likely in households with more educated females. Their result agrees with other studies undertaken in China by Li, et al. (2011a) and Nicaragua by Vaessen (2001). Li, et al. (2011a) study, among the other 12 variables found to be significant in their study demonstrated that credit borrowers who had achieved secondary school level in China were more likely to access Rural Credit Cooperative (RCC) microcredit programmes.

An empirical result of microcredit assessment in Northern Nicaragua showed that better educated and larger households were more likely to become clients (Vaessen, 2001).

However, this is not the case for rural credit accessed by small farmers in South Africa and Zanzibar, which revealed that education attainment of the clients had a negative effect on farmers' decisions to use credit (Mohamed, 2003; Sebopetji and Belete, 2009). An

interesting finding by Mohamed (2003) revealed a negative, but significant correlation coefficient when using logistic analysis in Zanzibar. The results imply that the availability of credit services from the small credit schemes targeted the poor and vulnerable in the rural areas and the majority of them had lower educational levels.

A study by Sebopetji and Belete on South African farmers showed that the higher educated households have a better socio-economic position from not using microcredit products in their agricultural production. Sebopetji and Belete (2009) argued that highly educated small-scale farmers would have enough money to finance their agricultural production in South Africa. This result corresponds to a study in Pakistan by Nouman, et al. (2013). Using an ordered logit approach, Nouman, et al. (2013) showed that the likelihood of demanding a larger amount of credit decreases as the level of farmers' education increases. As a result, less educated farmers are more likely to ask for greater levels of credit (more money) the more educated farmers (see for instance, Akram, et al., 2008; Okunade, 2007; and Saleem, et al., 2010).

6. Income of Rural Households

A study by Li, et al. (2011a) showed that household income affects the likelihoods of accessing microcredit in Hubei Province, China. According to the authors, there is a positive and significant relationship between income and credit accessibility by rural households in China. The study found that higher income households are more likely to have their microcredit application accepted. Based on a logit regression, the authors also estimated that households that earned higher incomes tend to have more investments and are more likely to apply for credit support. Thus, they might be more confident of their ability to repay

their loans. As a result, higher income households are more inclined to access microcredit (Li, et al., 2011a).

This finding supports in other location empirical results, such as in Bangladesh (Evans, et al., 1999) and Zanzibar (Mohamed, 2003). Evans, et al. (1999) found a positive and significant relationship between annual household income and credit access in Bangladesh. By measuring the participation of members of the BRAC Rural Development Programme (BRAC-RDP), Evans, et al. (1999) hypothesised, indirectly, that rural households that earned incomes lower than 1000 Thaka faced credit constraints. In a contrast, following study in Zanzibar uncovered a negative but significant relationship between household income level and credit access (Mohamed, 2003). The study shows that low income households have better chances to access credit from formal and quasi-formal financial institutions. One possible reason is that microcredit programmes are aimed at targeting to the “real” poor (lower income borrowers).

Another empirical study (Umoh, 2006), measuring the probability of credit access in Nigeria, has shown that the income level of borrowers is inversely related to the demand for credit. This implies that an increase in the income of clients will reduce their likelihood demand for credit. Additionally, Akudugu, et al. (2009) have studied women’s access to credit in rural banks in Ghana. The authors showed a significant and positive correlation between income level and the probability of accessing microcredit. Furthermore, the authors argued that the income levels of borrowers have greatly influenced women’s access to microcredit in Ghana.

7. Assets

Asset of borrowers also influences the probability of accessing microcredit. Clients who are less budget-constrained or who have more surplus funds are less likely to apply for credit. For example, Li, et al. (2011a) tested household assets as the independent variable and they found that it was negatively related to and significantly affects the likelihood of becoming MFIs clients in China. Furthermore, the authors suggest that families who have less valuable assets tend to access microfinance providers more than well-off households. Hence, rural households that are less budget-constrained tend not to borrow from MFIs.

Similarly, Evans, et al. (1999) challenged the widespread notion of microfinance programmes set up to target poor households actually favoured the wealthier poor households. The authors suggest that rural household participation in microcredit might be constrained by the ownership of physical assets. In comparing some groups of clients of the BRAC's RDP programme in Bangladesh, the authors reported that there was a negative and significant relationship between asset ownership and the likelihood of microfinance participation. Furthermore, Evans, et al. (1999) speculated that the reason why rural households are credit rationed is because the majority of female-headed households are the poorest; hence, they are unable to participate in microcredit programmes.

8. Collateral

Financial institutions, whether formal or informal, which cater for rural borrowers always face an asymmetric information problem for which they have to screen for potential clients who could default on their loans (Ho, 2004; Nagarajan and Meyer, 1996). Given this risk, the ability to provide collateral to MFIs becomes one of the screening mechanisms for

microcredit providers. Ho (2004) studied the impact of collateral on credit accessibility and found that households that are capable of providing collateral and/or finding a guarantor are more likely to use formal or semi-formal credit providers in Vietnam. The lack of collateral may significantly increase the probability of rural households borrowing from the informal credit market. This is because, based on Vietnam Land Law, households and individuals can use land-use rights certificates to obtain credit from the formal financial institutions (Ho, 2004). In addition, Nagarajan and Meyer (1996) provided evidence of similar results from a study of Philippines microfinance that tested land-linked contracts and ownership land status as collateral and showed a negative and significant relationship between collateral and probability of credit access. The authors argued that lenders would reject applicants because of insufficient collateral. However, the results also indicate that access to microcredit lenders is greater for asset poor small farmers with good reputations and who also engage in non- and off-farm activities.

2.6 Determinants of the Welfare Impact of Microcredit

Microfinance programmes should be assessed as to whether their goals to alleviate poverty in rural households can be achieved in the interests of donors, governmental agencies and other stakeholders. The impact assessment is to measure to what extent microcredit borrowers have been able to develop themselves economically. That is, to what extent has their income, contribution to the family expenditure and savings increased after being involved with a microcredit institution? However Khalily (2004) notes that, debates emerge over the methods for measuring the welfare impacts of microcredit. These consist of the problem of possible selection bias, the endogeneity programme, placement and fungibility of the fund.

The selection bias problems could appear when impact studies cannot identify unobservable characteristics in the non-members of microfinance programmes. This can then lead to erroneous conclusions, while the endogeneity placement issue may cause the underestimation or overestimation of average programme impacts (Coleman, 2006). Finally, the fungibility of a fund question arises from the inability to separate the uses of microcredit and other funds between households and enterprises (Khalily, 2004).

In measuring welfare impacts of microcredit researchers attempt to produce rigorous empirical results. As Armendáriz and Morduch (2010) point out, the impacts of microfinance could be challenging in the way that anecdotes are selected to show the potential of microfinance, while the statistical analyses are designed to show typical impacts across studies and countries. Previous studies, such as Coleman (1999), Karlan (2001), and Pitt and Khandker (1998), have measured the welfare effect of microfinance in several countries. For example, Morduch (1998) studied a microfinance flagship programme in Bangladesh, and found that the most important impacts were associated with the reduction of vulnerability, not of poverty *per se*. Morduch argued that the consumption-smoothing appears to be driven largely by income-smoothing, not by borrowing and lending. Further, Swamy (2014) assessed microcredit impacts in the context of the gender dimension in India using panel least squares and generalised methods of moments. The author found that the income growth net of inflation effect was 8.40% for women compared with 3.97% for men, indicating that the gender of the participating poor undoubtedly affected the outcomes of these programmes (Swamy, 2014).

Welfare impact assessments vary across countries and regions due to different programme designs, and socio-economic and country demographic factors. Khandker (2005) indicated that microcredit programmes account for more than half of the three percentage points (five percentage points in 1992/1991 to two percentage points in 1998/1999) reduction in poverty rates among programme participants in Bangladesh. The author evaluated whether the microfinance programme had a sustainable impact on poverty reduction using panel data with a quasi-experimental survey design, between 1991/92 and 1998/99, to determine the demand for loans from a group-based microfinance programme. Further, Khandker (2005) argued that instead of increasing household consumption levels in Bangladesh, microcredit programmes have exhibited spill-over effects on the programme participants in escaping from poverty while it benefits non-participants through the growth of the local economy.

Li, et.al (2011b) evaluated the impact of microcredit on rural households in China by measuring household welfare outcomes as captured by their income and consumption. Using a different-in-different (*DID*) approach, Li, et al. showed that the total amounts of micro loans obtained by the households have a positive and significant impact on both welfare outcomes investigated, suggesting that the households would benefit more as they become more involved in the microcredit programme (characterised by a growing loan size). Their findings re-affirmed worldwide empirical studies in the microfinance literature that participating in microcredit programmes could help in improving rural households' welfare by increasing their income and consumption. However, Li, et al's empirical results also revealed that the majority of the better-off beneficiaries were in non-targeted groups/non-poor households. Consequently, the impact of microfinance in China does not necessarily

mean that microcredit programmes reduce poverty levels in rural areas of China (Li, et al., 2011b; Saad and Duasa, 2009; Pitt and Khandker, 1998).

Another recent finding from a welfare impact assessment of group-lending microcredit in Bangladesh also showed that money invested in microcredit programmes by clients has significantly increased their income, agricultural productivity, expenditure and may solve the unemployment issue in rural areas (Rahman and Ahmad, 2010). Based on a logistic regression, Rahman and Ahmad (2010) showed that household income, productivity of crops and livestock, expenditure, and employment increased significantly due to the influence of invested money from microcredit programmes. Moreover, the authors studied a specific type of MFIs termed Islamic microfinance which is based on Sharia tenets. This microfinance institution, the Islamic Bank Bangladesh Limited (IBBL), was launched as a Rural Development Scheme (RDS) in 1995. The purpose of such microfinance programmes is to alleviate rural poverty by providing small and micro investments to the agricultural and rural sectors with the aim of generating employment and raising incomes of the rural poor. Furthermore, despite the lack of training facilities and small loan sizes, Islamic MFIs in Bangladesh have successfully altered and improved the standard of living of rural households in terms of their food and total expenditure (Rahman and Ahmad, 2010).

On the other hand, a study in Thailand indicated that better-off households were more likely to participate in a microcredit programme than poorer households. Furthermore, microcredit programmes positively affect household welfare for the committee members but the impacts are insignificant for the rank and file members or worse-off members (Coleman, 2006). Coleman noted that the differential impacts between committee members

and rank-and-file members could be the result of their differential access to loans, with committee members' having greater access which allow them to invest in different types of projects, which can be harnessed or realised only by access to credit.

Studies of welfare impact assessment can also be divided by three levels of measurements namely: household impacts, individual improvement and village level. Hawariyuni, et al. (2014) investigated changes of small enterprise economic performance in terms of changes in income, fixed assets and household expenditure. The authors studied the determinants of welfare impacts of BRI clients in the North Sumatra Province in Indonesia. Hawariyuni, et al. showed that microcredit has a positive and significant welfare impact on households' income and fixed assets. However, there appeared to be no significant impact of microcredit on the changes in household expenditure. In addition, Saad and Duasa (2009) conducted a study to assess Malaysian microfinance institutions using the OLS model to evaluate the economic performance of clients participating in the microcredit programmes of Amanah Ikhtiar Malaysia (AIM). The authors' results showed that economic performance, as measured by per capita income, and the spending ratio of income and assets are correlated and significant to the loan amount of AIM clients (Saad and Duasa, 2009). The empirical results from the Saad and Duasa study corresponds with previous research conducted in Bangladesh (Khandker, et al., 1998) and a study measuring well-being impacts on women in Ghana (Amoako and Awuah, 2014). Khandker, et al. (1998) documented that microcredit programmes (such as Grameen Bank, BRAC and the RD-12 microcredit programme) have brought about desirable impacts in terms of income, employment and production in the non-farming sector at the village level in Bangladesh. More importantly, microcredit disbursements to rural households have increased the average household income level. This

has been by 29% (Grameen Bank), 33% (BRAC) and 21% (RD-12). On the other hand, Amoako and Awuah (2014) tested the impact of small loans provided to rural women in Ghana using ordered logistic regression. They found that women who have accessed microcredit had improved their well-being as measured by four indicators - ability to afford quality healthcare, children education, daily meals and access to comfortable accommodation.

2.7 Summary

This chapter provided an extensive overview of microfinance definition, development and types of Indonesia MFIs. The chapter also reviewed problems been faced by rural households in Indonesia. Current literatures have obviously showed the issues of credit access for rural households. Further, this chapter revealed households characteristic determining rural households to access MFIs such as gender, ages, household size, networking, educational attainment, income of households, etc. Furthermore, previous studies argued that access to microfinance institutions has hindered rural household to improve their livelihood by increasing their income, expenditures and their assets. Most importantly, previous studies stressed that households characteristics should be taken into account to clearly assess the welfare impact of microfinance and determinants of clients or non-clients of MFIs.

Chapter 3

RESEARCH METHODS

This chapter presents the research methods used in the current study. Different research models were chosen and their theoretical frameworks were examined for their suitability to address each of the research questions. The binary logistic regression model was chosen to estimate the factors influencing the accessibility of credit for rural households and to determine the characteristics of the clients and non-clients of microcredit. Multinomial logistic analysis was employed to measure the welfare impacts of the microcredit provided to micro-borrowers. This chapter concludes by describing the survey instrument, the sample design and the data collection procedures used during the primary data collection.

3.1 Theoretical and Econometric Models

3.1.1 Model for Determinants of Credit Accessibility

There is no direct method to measure credit accessibility. However, it can be examined indirectly by using an empirical study of formal and informal borrowings. Karugia, et al. (2005) and Ravi (2004) used formal and informal borrowings as an indicator of credit accessibility. Both studies have used logistic models to test the determinants of the likelihood of whether rural households have been able to access microcredit (credit granted) or were rejected. This current study also used the borrowings observed from formal, informal, and other microcredit lenders as a proxy for credit access. Further, this study measured credit accessibility of rural households, whether or not their credit applications were approved. Previous studies (see for instance, Kashuliza and Kydd, 1996; Li, et al.,

2011a; Umoh, 2006; Vaessen, 2001) that determined rural households' accessibility to microfinance took into account both household and institutional level characteristics. This current study follows the Raleting and Obi (2015) binary logistic regression model to analyse the accessibility of microcredit from the perspective of the rural household. Binary logistic regression is useful when the dependent variable is dichotomous (Chan, 2005). The binary model has been used widely in a number of fields including the social sciences when investigating dichotomous variables (Mohamed, 2003; Scott Long, 1997). Using the logit regression model, Vaessen (2001) determined the factors affecting microcredit accessibility in Nicaragua. Vaessen tested the probability of rural households influenced by observable factors. Those variables include education, age, family size, household assets, collateral, type of business and networking. The binary results of the logistic model measures whether rural households' loan application was accepted or rejected (Chaudhary and Ishfaq, 2003; Li, et al., 2011a; Umoh, 2006). Thus, the binary response in our study defines Y=1 for loan application accepted and Y=0 for loan application rejected. The model specification can be written as follows:

$$\ln(Y_1) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (3.1)$$

$$\ln(Y_0) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (3.2)$$

By equations 3.1 and 3.2, there are two probabilities with, Y0 denoting the lower response category (rejected) and Y1 representing the higher response category when rural

households apply for microcredit. Both equations present the outcome of the logit transformation of the odds ratio which compactly written as:

$$\ln(Y_0/Y_1) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n \quad (3.3)$$

Equation 3.3 allows its estimation as a linear function with the following definitions: β_0 = the constant for the intercept of the regression, $\beta_1, \beta_2, \beta_n$ = the regression coefficients of the individual variables; X_1, X_2, \dots, X_n (explanatory variables). By combining equations (3.1) and (3.2), the parametric functional form can also be written as follows:

$$Y_{in}^* = \ln\left(\frac{P_{in}}{1-P_{in}}\right) = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}) + \epsilon_{in} \quad (3.4)$$

Where Y_{in}^* = Decision on microcredit application, (where 1= approved and 0= rejected); and

P_{in} = the probability of choices. Table 3.1 depicts the explanatory variables used in equation 3.4 and the expected a priori sign of the variables.

Table 3-1: Summary of Explanatory Variables in Binary Logit Model

Variables Name	Variable label	Coding	Expected signs
Gender of clients	GEND	1=male and 0=female	(+/-)
Age of borrowers	AGE	1=18-25 years; 2=26-35 years; 3=36-45 years; 4=46-55 years; 5=56-65 years; 6= above 65 years	(+/-)
Household size	HSIZE	1 =1 member; 2=2 members; 3=3 members; 4=more than 3 members	(+)
Networking	NET	1= with networking; 0=otherwise	(+)
Educational attainment	EDU	1=Non-formal; 2=Primary; 3=Secondary; 4=High School, 5=College; 6=Bachelor; 7=Postgraduate	(+)
Household income (monthly)	INCOME	1=< IDR 330,776.00; 2=IDR 330,776.00 - IDR 1,163,800.00; 3=IDR 1.163,800.00 - 5,000,000.00; 4=> IDR 5,000,000.00	(+)
Household assets	ASSET	1=Farm lands / buildings; 2=Livestock; 3= Agricultural machineries; 4= Car / Motorcycles; 5=Others	(-)
Collateral	COL	1= with collateral, 0=otherwise	(+)
Distance to MFIs	DIST	1=< 5Km; 2=5 – 10 Km; 3=10-20 Km; 4 = >20 Km	(-)
Loan Duration	DUR	1= less than 6 months; 2=6 months – 1 year; 3=1 – 2 years; 4=2-3 years; 5(more than 3 years)	(+)

3.1.2 Estimated signs of independent variables:

Previous empirical studies by Li, et al. (2011a), Sarap (1990), Tang, et al. (2010), Vaessen (2001), and Wydick, et al. (2011) investigated the household characteristics that influenced credit accessibility. These household characteristics include household size, networking of clients, educational attainment, income, household assets, collateral and interest rates. The studies have found positive indeterminate and negative significant determinants that influenced the probability of microcredit access. For example, *age* and *distance to the nearest MFIs* were indeterminate factors that affected microcredit accessibility. Li, et al.

(2011a) showed the *distance* variable negatively influenced the likelihood of rural households in China to access microcredit. The study found that households that resided more than 20 lis (10 km) from the nearest MFIs branch were less likely to be granted credit because of higher transaction and time opportunity costs.

Further, the *age* of the borrower was a key factor affecting borrowers' access to microcredit. Mohamed (2003) found that the age of the clients had a negative but significant relationship with credit acceptance. This finding suggested that older people were less likely to get credit approval than younger borrowers. In addition, Ho (2004), Li, et al. (2011a), and Wydick, et al. (2011), found that the *assets* of borrowers have a negative and significant relationship with credit accessibility. This means that households who are wealthier or less budget constrained are less likely to apply for microcredit. In contrast, *income* of borrowers also exhibits a positive correlation with loan acceptance, meaning that the higher the income of the rural household borrowers, the greater the probability that the borrower's loan application will be accepted (Evans, et al., 1999; Li, et al., 2011a; Mohamed, 2003).

The impact of *gender* on credit accessibility was indeterminate. Okten and Osili (2004) found that females were more likely to be granted credit. The authors indicated that microcredit providers preferred lending to females due to their lower default rates. However, female borrowers were also found to be discriminated against in the credit market (Ho, 2004; Kashuliza and Kydd, 1996; Zeller, 1994).

A positive and significant correlation between credit accessibility and other explanatory variables could be found for *household size*, *recommendations*, *educational attainment*,

collateral, and loan duration. Studies in South Africa (Okurut, 2006) and India (Sarap, 1990), have shown that the larger the *family size*, the more likely they are to be able to access microcredit. *Recommendations*, as a proxy for *networking* to MFIs, also played a significant role in influencing microcredit approval (see for example, Coleman, 2006; Okten and Osili, 2004; Vaessen, 2001). This implies that rural borrowers with closed relationship with MFIs officers would have a higher probability of accessing microcredit. Moreover, there are positive and significant correlations between level of *education* and credit accessibility for rural households. Evans, et al. (1999) revealed that rural households with higher levels of educational attainment are more likely to take advantage of the microcredit market. The *collateral* variable is hypothesised to positively influence credit accessibility. A study by Nagarajan and Meyer (1996) found that by providing collateral, rural borrowers would increase their probability of accessing microcredit. Further, there is a positive and significant correlation between *loan duration* and credit accessibility. Abaru, et al. (2006) found that loan duration positively affects the probability of rural farmers' access to agricultural credit in Uganda.

3.1.3 Model for Welfare Impacts of Microfinance Institutions in Indonesia

There were several approaches to estimate the welfare impacts of microfinance programmes, such as Difference in Differences model (Kondo, et al., 2008; Li, et al., 2011b) and the Ordinary Least Square (OLS) model (Rahman and Ahmad, 2010). The Difference in Differences (DID) model has become “increasingly popular in measuring causal effects of programmes or treatments in the absence of pure experimental data”. In microcredit assessment, this method requires the welfare outcomes from the borrowing groups and non-borrowing groups (Li, et al., 2011b). In addition, the DID model also compares between

pre-treatment and post-treatment periods of microcredit programmes. Further, the OLS model can be used to estimate the welfare impact if the dependent variables are continuous values (e.g., in dollar incomes) such as used in previous studies by Rahman and Ahmad (2010) and Hawariyuni, et al. (2014). However, the dependent variables measured in our study are qualitative and limited range of dependent variables. Furthermore, a multinomial logistic model is employed to test the welfare impacts of microcredit. The empirical model in our study follows the Olomola (2000) study which used a multinomial logistic model. Olomola measured microcredit performance in three categories of dependent variables. Those categorical measurements comprised *good credit risk, delinquents, and defaulters*. Based on the Olomola MNL model, our study classifies three dependent variables for measuring microcredit impacts (household income, assets of borrowers and household expenditure). The MNL model is coded as three outcomes in measuring the welfare impact of microcredit (1= decrease; 2 = no change; and 3= increase). Following Olomola (2000), the MNL model is written as follows:

$$\text{Prob}(Y_i=j)=\frac{e^{\beta_j x_i}}{\sum_{m=0}^2 e^{\beta_j x_i}} \quad j = 0,1, \text{ or } 2\dots, \quad (3.5)$$

where β_j is a vector of parameters that relates the independent variables, x_i to the probability of $Y_i = j$. Because the three probabilities must sum to zero, a convenient normalization rule is to set one of the parameter equal to zero. The probability for the three alternatives can then be expressed as follows:

$$P_0 = \text{Prob}(Y_i=0)=\frac{1}{1+\sum_{m=1}^2 e^{\beta_m x_i}} \quad (3.6)$$

$$P_j = \text{Prob}(Y_i = j) = \frac{1}{1 + \sum_{m=0}^2 e^{\beta_m x_i}} \quad j = 1 \text{ or } 2, \dots, \quad (3.7)$$

Insights into the welfare impacts of the explanatory variables can be captured by examining the derivative of the probabilities with respect to k^{th} element of the vector of explanatory variables. Further, the variables which significantly affect welfare impacts of credit borrowers are determined quantitatively in a model explicitly specified as follows:

$$Y_{in} = \ln\left(\frac{P_{in}}{1 - P_{in}}\right) = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}) + \epsilon_{in} \quad (3.8)$$

where, Y_{in} = welfare impacts in terms of household income, assets of borrowers and household expenditure (with outcomes defined as 1= decrease; 2= remain the same; and 3=increase). Table 3.2 depicts the explanatory variables used in equation (3.8) and the expected a priori signs of the variables.

Table 3-2: Summary of Explanatory Variables used in the Multinomial Logit Model

Variable Name	Variable Label	Coding	Expected Sign
Loan amount	AMOUNT	1 < IDR 1,000,000.00; 2 = IDR 1,000,001.00 to IDR 2,500,000.00; 3 = IDR 2,500,001.00 to IDR 5,000,000.00; 4 = IDR 5,000,001.00 to IDR 10,000,000.00; 5 = IDR 10,000,001.00 to IDR 15,000,000.00; 6 > IDR 15,000,001.00	(+)
Age of borrowers	AGE	1=18-25 years old; 2=26-35 years old; 3=36-45 years old; 4=46-55 years old; 5=56-65 years old; 6 =above 65 years old	(+)
Marital status	MAR	1=Single/Never Married; 2=Married; 3=Widow/Widower; 4=Divorced/Separated	(+)
Household size	HSIZE	1 =1 member; 2=2 members; 3=3 members; 4=more than 3 members	(+)
Household income	INCOME	1 < IDR 330,776.00; 2 = IDR 330,776.00 - IDR 1,163.800.00; 3 = IDR 1.163,800.00 - 5,000,000.00; 4 > IDR 5,000,000.00	(+)
Household expenditure	EXPEND	1 < IDR 330,776.00; 2 = IDR 330,776.00 - IDR 1,163.800.00; 3 = IDR 1.163,800.00 - 5,000,000.00; 4 > IDR 5,000,000.00	(-)
Occupation	OCCUP	1= Crop farmer; 2= Fisherman; 3= Factory worker; 4= Seasonal worker/casual jobs; 5= Small entrepreneur; 6= Public Servant/ Army/Police; 7= Retired; 8= Unemployed; 9= Others	(+)
Educational achievement	EDU	1=Non-formal; 2=Primary; 3=Secondary; 4=High School; 5=College; 6=Bachelor; 7=Postgraduate	(+)
Purpose of loan	PURPOSE	1=Expanding business, manufacturing, trading, or service activities; 2=Buying car / motorcycle; 3=Emergency needs; 4=Social needs; 5=Daily consumption; 6=Financing new small project(s); 7=Paying other debts; 8=Others	(+)

3.1.4 Estimated signs of independent variables:

Positive correlations between the dependent variables and explanatory variables are predicted for socio-demographic variables, such as *loan amounts, age of borrowers, marital status, household size, educational achievement, occupation, household income, loan duration and purpose of loan*. The *loan amount* received by rural households is also a key determinant influencing the welfare impacts from microfinance. Previous studies (see for example, Saad and Duasa, 2009; Rahman and Ahmad, 2010), have shown that there is a positive and significant correlation between the size of loan received and the impact of microcredit. The size of loan granted to rural borrowers exhibits a positive relationship with the income of the rural households. This result supports the Hawariyuni, et al. (2014) findings in MFIs' impact assessments, which argued that if there is an increase in microcredit received by clients then their income levels would increase. Hawariyuni, et al. (2014) argued that microcredit provided to MSMEs would increase their monthly income after borrowing from MFIs in Indonesia. This finding also supports Rahman and Ahmad's (2010) research, which showed an increased in of household income when rural households accessed Islamic microcredit in Bangladesh.

A positive relationship is predicted if the MFI clients have more *household* income which increases their welfare impacts (Li, et al., 2011b; Rahman and Ahmad, 2010). This implies that a higher household income would be more likely to augment welfare impacts.

Meanwhile, the *age of borrowers* also positively and significantly influences the welfare impact from microcredit. The empirical studies suggest that older borrowers tend to be more experienced in using credit, leading to an increase in their welfare outcomes from having credit (Khandker, et al., 1998; Li, et al., 2011b; Rahman and Ahmad, 2010). Moreover,

household size is expected to be positive and significantly affects the welfare impact of microcredit. This means that the more the family members in a household contribute to family income, the more likely they will attain a greater welfare impact after accessing microcredit.

Other studies also show that *household expenditure* is a negative but significant determinant affecting micro-borrowers' welfare. Hawariyuni, et al. (2014) and Rahman, et al. (2014) argue that households which spent more of their monthly expenditure are less likely to achieve a higher welfare impact after receiving microcredit. Moreover, Saad and Duasa (2009) assessed microcredit impacts in Malaysia and found that married borrowers significantly affect borrowers' assets compared to unmarried borrowers.

Education attainment also positively and significantly influences the likelihood of increasing the welfare of borrowers. A study by Coleman (2006) has suggested that higher educated borrowers are more likely to increase their assets from the provision of microcredit. Finally, *purpose of loan* is hypothesised as a positive and significant determinant affecting the welfare impacts of microcredit. This implies that credit provided to micro-borrowers used for productive activities tends to increase household's income.

3.1.5 Identifying Consumers and Non-Consumers of Microcredit in Indonesia

Research objective three tests the socio-demographic attributes of rural households who did or did not use microcredit. The logit model is used, since the dependent variable (Yin) represents two groups of credit borrowers. This model uses the logistic regression, as displayed in equation (3.4). The groups of borrowers who are clients of microcredit are

denoted as $Y_{1n} = 1$, and associated with a utility of U_{1n} based on the observed household characteristics and attributes. The non-clients of microcredit are denoted as Y_{1n}^{**} and associated with utility as U_{0n} (Mohamed, 2003). The latent variable, Y_{1n}^{**} is given in the equation as:

$$Y_{1n}^{**} = (V_{1n} - V_{0n}) + (\epsilon_{1n} + \epsilon_{0n}) \quad (3.9)$$

$$= X_{1n}^{**} \beta + \epsilon_{1n}^{**} \quad (3.10)$$

Logistic regression is used in this model since the binary outcome of (Y_{1n}) represents microfinance clients and non-clients of microfinance. The general parametric functional expression of this model can be given as follows:

$$Y_{in} = \ln\left(\frac{P_{in}}{1-P_{in}}\right) = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}) + \epsilon_{in} \quad (3.11)$$

where Y_{in} is credit borrowers (where 1= use microcredit; 0 = do not use microcredit). Table 3.3 depicts the explanatory variables and the expected a priori sign used in equation (3.11).

Table 3-3: Summary of Explanatory Variables used in Binary Logit Model

Variable name	Variable label	Coding	Expected sign
Gender of consumers	GEND	1= male; 0=female	(+/-)
Age of borrowers	AGE	1=18-25 years old; 2=26-35 years old; 3=36-45 years old; 4=46-55 years old; 5=56-65 years old; 6 = more than 65 years old	(+)
Marital status	MAR	1=Single/Never Married; 2=Married; 3=Widow/Widower; 4=Divorced/Separated	(+)
Educational attainment	EDU	1=Non-formal; 2=Primary; 3=Secondary; 4=High School; 5=College; 6=Bachelor; 7=Postgraduate	(+)
Occupation	OCCUP	1= Crop farmer; 2= Fisherman; 3= Factory worker; 4= Seasonal worker/casual jobs; 5= Small entrepreneur; 6= Public Servant/ Army/police; 7= Retired; 8= unemployed; 9= others	(+)
Household income	INCOME	1=< IDR 330,776.00; 2=IDR 330,776.00 - IDR 1,163.800.00; 3=IDR 1.163,800.00 - 5,000,000.00; 4=> IDR 5,000,000.00	(+)
Household expenditure	EXPEND	1=< IDR 330,776.00; 2=IDR 330,776.00 - IDR 1,163.800.00; 3=IDR 1.163,800.00 - 5,000,000.00; 4=> IDR 5,000,000.00	(-)
Loan duration	DUR	1= < 6 months; 2= 6 months to1 year; 3= 1 to 2 years; 4= 2 to 3 years; 5= > 3 years	(+)
Purpose of loan	PURPOSE	1=Expanding business, manufacturing, trading, or service activities; 2=Buying car / motorcycle; 3=Emergency needs; 4=Social needs; 5=Daily consumptions; 6=Financing new small project(s); 7=Paying other debts; 8=Others	(+)

3.1.6 Estimated signs of the independent variables:

The independent variables in equation (3.11) comprise of *gender, age of consumers, marital status, educational achievement, occupation, household income, expenditure, loan duration, and purpose of loan*. Based on equation (3.11), the positive and significant coefficients are

hypothesised for the *consumer's age, marital status, educational level, occupation, household income, loan duration, and purpose of loans*. The age of borrowers, educational attainment, household income per month, monthly expenditure by borrowers, and loan duration, as detailed in the previous logit model, are expected to be positive and significant factors in determining clients and non-clients of MFIs (Chaudhary and Ishfaq, 2003; Evans, et al., 1999).

Evans, et al. (1999) also indicated that there is a negative and significant correlation between household *expenditure* and the clients or non-clients of microcredit. This is because households who spent more of their monthly expenditure would be less likely to participate in microcredit. Further, Chaudhary and Ishfaq (2003) and Li, et al. (2011a) suggest that the *occupation* of clients could also have an influence on the factors that differentiate between the clients of microcredit. A positive and significant determinant is expected because clients who engage in stable and productive income-generating activities are more likely to become clients of microcredit. Moreover, Sebopetji and Belete (2009) found that the *marital status* of rural households affected their likelihood of being microcredit clients. However, the *gender* impact of household borrowers is indeterminate. Churchill (1999) and Li, et al. (2011c) studies have shown a positive and significant correlation for the likelihood of rural borrowers and female participation in microcredit. Further, Evans, et al. (1999) have indicated that other risk factors, such as low education, small family size, and being landless, are negative and significant factors influencing the probability of a rural household to use microcredit in Bangladesh. The findings imply that having lower education, small household size, lower assets reduce the probability of microcredit participation. Finally, purpose of loan is hypothesised as a positive and significant determinant affecting the probability of rural

households being clients of MFIs. Ho (2004) has concluded that microcredit used for consumption purpose positively and significantly affects rural household being borrowers of informal MFIs.

3.2 Data Collection Procedure

3.2.1 Sampling Design

The study sample size is determined by the Cochran (2007) formula used in most primary data collection, as follows:

$$n = \frac{z^2 pq}{e^2} \quad (3.12)$$

Where, n is sample size, z^2 is the square of the critical value of the normal curve that cuts off an area defining significance at the tails, e is the desired level of precision, p is the estimated proportion of an attribute that is present in the population, and q is $1-p$. This study used the 95% (or $\pm 5\%$ precision) level of confidence and assumed $p = 0.5$ and $q = 0.5$. Therefore, based on equation 3.12, the total minimum sample size for our study is 385 rural households in Indonesia. The current study interviewed 591 respondents to obtain sufficient completed responses for the analysis. The survey was conducted in the Special Province of Yogyakarta, in particular, the Bantul district, from February-March 2016. The Bantul is located in Yogyakarta Special Region in Indonesia. It lies between $07^\circ 44' 04''$ - $08^\circ 00' 27''$ south latitude and $110^\circ 12' 34''$ - $110^\circ 31' 08''$ east longitude and has a population of 919,440. Amongst Bantul residents (25.56%) still relied on the agricultural sector as their main occupation; while 21.16% of them worked in trades and the other 19% and 17% of people worked in small industries and the services, respectively⁶. Among those residents, there are

⁶ Data from: https://bantulkab.go.id/datapokok/1001_lembaga_keuangan.html

44,778 micro, small and medium enterprises (MSMEs) which could potentially demand microcredit. Meanwhile, there are 19 formal MFIs that catered for small loans (including commercial and rural banks/BPR). In addition, the Industry and Cooperative District Office (Disperdagkop) estimates there are 463 informal MFIs (cooperatives)⁷.

3.2.2 Survey Instruments

In order to address the research objectives of this study, a structured questionnaire was developed to obtain the data for empirical analysis. The questionnaire was submitted to the Lincoln University Human Ethics Committee for approval. The questionnaire was printed bilingually, in English and *Bahasa Indonesia*. The translation into Bahasa Indonesia was verified by asking several Indonesian students to read the questionnaire and giving the feedback on the draft. Before the administering the survey questionnaire, the questionnaire was randomly pilot-tested with 20 rural households in Bantul District. This helped to rectify any ambiguities before administering the questionnaire to the sample rural households.

The survey questions are based on the literature and the overall objective of the study. The structured questionnaire consisted of three sections: Section 1 identified the determinants of credit accessibility for Indonesian rural households. The questions measured information on respondents' sources of finance, the amount and purpose of their loans, as well as the duration of them, the interest rates and interest repayment methods. Section 2 of the questionnaire focused on the welfare impacts of microfinance (microcredit) on rural households in Indonesia. In this regard, the socio-demographics factors of the households and other household characteristics, such as household networking, wealth and assets, and

⁷ Data from: <http://perindagkop.bantulkab.go.id/>

village/commune characteristics factors, such as distance to nearest to MFI, are tested for significance of the covariates on the households' welfare. Section 3 includes the profile of the rural households' demographic characteristics such as age, ethnic, marital status, household characteristics, educational level, and experience.

3.2.3 Data Collection Process

The field-work for collecting the primary data was conducted over two months; February and March 2016. Nine research assistants helped to interview the participants during the survey. Rural households were asked if they would voluntarily agree to participate in the research and if they responded with a yes, survey assistants would return to collect the completed questionnaires. A total of 591 survey questionnaires were administered and returned, of which 488 responses were usable, generating a response rate of 82.57%. Completed questionnaires were then coded, entered into Excel, and imported into STATA 13 software for analysis.

3.3 Summary

Chapter three explored the models used to measure the determinants of credit accessibility on Indonesian rural households. Determinants of household characteristics are tested using empirical approaches of binary logit and multinomial logit model. Theoretical frameworks are discussed why those models are chosen to test the credit accessibility, welfare impacts and client/non clients of microcredit. Type of the data used in this study is primary, collected from convenience random sampling methods. The questionnaires are distributed across rural households in the prospective areas. That is why the step-by-step procedures are also discussed to gain reliable responses.

Chapter 4

EMPIRICAL RESULTS

This chapter provides the empirical results from applying the previous models explored in chapter three. The first section of this chapter details the profile of rural households in the surveyed area. The determinants of credit accessibility are analysed by interpreting results of the logistic regression. This model is also used to measure the characteristics of clients or non-clients of MFIs. Further, the multinomial logistic tests the impact of microcredit accessed by rural households. The chapter concludes with main findings after applying those three models.

4.1. Profile of the Respondents

This section presents the profile of the surveyed respondents in Bantul district. Table 4.1 shows the differences between microcredit borrowers and non-borrowers in terms of individual characteristics (gender, age, marital status, educational level, occupation, and work experience) and household characteristics (number of income earners, number of household members, household income and household expenditure per month). A chi-square test was performed to assess whether there are significant relationships between credit acceptance and the respondents' characteristics.

Table 4.1 shows that most of the borrowers in the sample are female (62.7%). Similarly, the non-borrowers in the surveyed sample are also predominantly female (63.9%). The chi-square test ($\chi^2 = 0.053$, insignificant at $p = 0.05$) confirmed that the status of borrowers and

non-borrowers is not related to gender. In other words, credit acceptance is not related to gender.

In terms of the respondents' age, a large number of the borrowers are aged between 36 and 45 years (38.9%) while another large proportion of non-borrowers are aged between 26 and 35 years (33%). Moreover, 11.3% of non-borrower respondents are in the young age group (18-25 years) while, in contrast, only 4% of borrowers are in that same age group. The chi-square test value ($\chi^2 = 13.77$, significant at $p = 0.05$) confirmed that the status of the borrowers and non-borrowers is related to their age groups.

The majority of the respondents are married, where the percentage of married borrowers (89%) is larger than for non-borrowers (75.3%). Additionally, a considerable percentage of non-borrowers (18%) are single or never married as compared to 7.2% of borrowers who are single. The chi-square test ($\chi^2 = 14.05$, significant at $p = 0.01$) revealed that there is a statistical and significant difference in terms of marital status between the borrowers and non-borrowers.

The result for educational attainment shows a non-significant relationship between educational level and participation in microcredit. The majority of non-borrowers and borrowers are high school graduates, 52.6% and 45.5%, respectively. Likewise, there is no significant relationship between work experience and microcredit participation, as most of the borrowers and non-borrowers have more than ten years' work experience. The chi-square results (non-significant at $p = 0.05$) show insignificant differences between borrowers and non-borrowers in terms of education level and work experience (see Table 4.1).

Regarding occupation, the majority of the borrowers (46.3%) work as small entrepreneurs, whereas the occupation of non-borrowers varied across many professions. The chi-square test ($X^2 = 18.43$, significant at $p=0.05$) shows a statistical and significant difference between the occupation of borrowers and non-borrowers. The results suggest that rural households who run small entrepreneur-type businesses are more likely to participate in microcredit programmes.

Table 4.1 also depicts the household characteristics of the respondents as represented by number of income earners in the households, household members (dependants), household income per month and household expenditure. The chi-square tests revealed no evidence of a statistically significant relationship between those household characteristics and microcredit participation.

Table 4.1 shows that the number of income earners in the family did not vary significantly between borrowers and non-borrowers. Most of the surveyed households have two income earners, followed by one income earner households and then, more than two income earners. The chi-square test ($X^2 = 1.044$, non-significant at $p=0.05$) confirmed that there is no significant difference in terms of income earned between borrowers and non-borrowers.

With regard to the number of household dependants of the respondents, a large number of borrowers have two and three family members, 27% and 28%, respectively. However, the majority of the nuclear families, with two and three members, are also common in the non-borrowers group. The chi-square test ($X^2 = 0.29$, non-significant at $p=0.05$) suggests that

there is no difference between borrowers and non-borrowers in terms of the number of household members.

In addition, households' monthly income is a non-insignificant variable differentiating borrowers and non-borrowers. The chi-square test ($X^2=3.47$ and non-significant at $p=0.05$) shows no statistically significant evidence that both groups varied in terms of income per month. The majority of borrowers are households who live above the poverty line⁸ (between IDR 330,777.00 - IDR 1,163,800.00, around 40%) and above the regional minimum wage⁹ (IDR 1,163,801.00 - IDR 5,000,000.00, 48.6%). Likewise, the majority of non-borrowers are in the group of the moderately poor (48.5% of incomes between IDR 330,777.00 - IDR 1,163,800.00 and 38.1% of incomes between IDR 1,163,801.00 - IDR 5,000,000.00).

Finally, the chi-square test shows no significant difference in terms of household expenditure between borrowers and non-borrowers ($X^2=3.06$, non-significant at $p=0.05$). The majority of the borrowers' monthly expenditure is between IDR 330,777.00 - IDR 1,163,800.00 (51%). Similarly, non-borrowers (52.6%) exhibit the same monthly expenditure.

⁸ USD 1.90 \$ per day, poverty line per month in Indonesia was IDR 330,777.00

⁹ Bantul minimum regional wage was: IDR 1,163,000.00

Table 4-1: Profile of the Surveyed Respondents (Individual and Household Characteristics)

Characteristics of the Respondents	Non-borrowers (n ₁ = 97)		Borrowers (n ₂ =391)		All respondents (n=488)		Statistical Test
	n	% of n ₁	n	% of n ₂	n	% of n	
Individual Characteristics							
<i>Gender</i>							
Female	62	63.9	245	62.7	307	62.9	χ ² = 0.053 p=0.05
Male	35	36.1	146	37.3	181	37.1	
Age group							
18-25 year-olds	11	11.3	16	4.1	27	5.5	χ ² = 13.77** p=0.05
26-35 year-olds	32	33.0	100	25.6	132	27.0	
36-45 year-olds	28	28.9	152	38.9	180	36.9	
46-55 year-olds	16	16.5	84	21.5	100	20.5	
56-65 year-olds	7	7.2	34	8.7	41	8.4	
Over 65 year-olds	3	3.1	5	1.3	8	1.6	
Marital status							
Single/Never Married	18	18.6	28	7.2	46	9.4	χ ² =14.05*** p=0.01
Married	73	75.3	348	89.0	421	86.3	
Widow / Widower	3	3.1	10	2.6	13	2.7	
Divorced/Separated	3	3.1	5	1.3	8	1.6	
Educational level							
No formal education	3	3.1	7	1.8	10	2.0	χ ² =10.15 p=0.05
Primary School	4	4.1	42	10.7	46	9.4	
Secondary/Junior High School	13	13.4	74	18.9	87	17.8	
High School	51	52.6	178	45.5	229	46.9	
College / Vocational	9	9.3	39	10.0	48	9.8	
Bachelor	14	14.4	48	12.3	62	12.7	
Postgraduate	3	3.1	3	0.8	6	1.2	
Occupation							
Crop farmer	10	10.3	46	11.8	56	11.5	χ ² =18.43** p=0.05
Fisherman	2	2.1	4	1.0	6	1.2	
Factory worker	15	15.5	63	16.1	78	16.0	
Seasonal worker/casual jobs	6	6.1	28	7.2	34	7.0	
Small entrepreneur	32	33.0	181	46.3	213	43.6	
Public Servant / Army / police	10	10.3	33	8.4	43	8.8	
Retired	8	8.2	14	3.6	22	4.5	
Unemployed	2	2.1	15	3.8	27	5.5	
Others	12	12.4	15	3.8	27	5.5	

Characteristics of the Respondents	Non-borrowers (n ₁ = 97)		Borrowers (n ₂ =391)		All respondents (n=488)		Statistical Test
	n	% of n ₁	n	% of n ₂	n	% of n	
Working duration							
Less than 1 year	11	11.3	25	6.4	36	7.4	χ ² =6.47 p=0.05
Between 1 and 3 years	24	24.7	69	17.6	93	19.1	
Between 3 and 5 years	21	21.6	90	23.0	111	22.7	
Between 5 and 10 years	13	13.4	69	17.6	82	16.8	
More than 10 years	28	28.9	138	35.3	166	34.0	
Household Characteristics							
Number of income earners in household							
1 earner	33	34.0	113	28.9	146	29.9	χ ² =1.044 p=0.05
2 earners	48	49.5	213	54.5	261	53.5	
More than 2 earners	16	16.5	65	16.6	81	16.6	
Number of household members							
1 member	19	19.6	84	21.5	103	21.1	χ ² =0.29 p=0.05
2 members	28	28.9	105	26.9	133	27.3	
3 members	28	28.9	110	28.1	133	27.3	
More than 3	22	22.7	92	23.5	114	23.4	
Household income (per month)							
< IDR 330,776.00	6	6.2	22	5.6	28	5.7	χ ² =3.47 p=0.05
IDR 330,777.00 - IDR 1,163,800.00	47	48.5	155	39.6	202	41.4	
IDR 1,163,801.00 - IDR 5.000.00.00	37	38.1	190	48.6	227	46.5	
> IDR 5.000.001.00	7	7.2	24	6.1	31	6.4	
Household expenditures(per month)							
< IDR 330,776.00	9	9.3	22	5.6	31	6.4	χ ² =3.06 p=0.05
IDR 330,777.00 - IDR 1,163,800.00	51	52.6	198	50.6	249	51.0	
IDR 1,163,801.00 - IDR 5.000.00.00	33	34.0	160	40.9	193	39.5	
> IDR 5.000.001.00	4	4.1	11	2.8	15	3.1	
Total	97	100	391	100	488	100	

Note: 1. ***, **, * indicates the significance levels at 1%, 5%, and 10% respectively

4.2. Empirical Results Related to Credit Accessibility

Logistic regression analysis based on equation (3.3) is used to identify the household factors influencing credit accessibility in the Bantul district. This empirical approach is used to capture the binary outcome of loan applications: accepted or rejected by the microfinance

institution (coded as 1=accepted or 0=otherwise). Among the 390 credit applicants, 362 households' (92.8%) applications were accepted, while 28 respondents (7.2%) were rejected. The independent variables for the model includes gender, age of respondents, household size, networking, educational attainment, monthly household income, assets, interest rates, collateral, and distance to the nearest MFI. Overall, the model correctly predicts 92.82% of credit accessibility. The likelihood ratio test exhibits a significant ($p < 0.01$) chi-square of presumably 20.48 (pseudo $R^2 = 0.1017$, significant $p < 0.05$) and thus allows rejection of the null hypothesis that all variable coefficients in the logistic model are equal to zero. Hence, the model can be used to explain the factors affecting credit accessibility.

Table 4-2: Results of Binary Logistic Regression on Credit Accessibility

No. of observations	390				
Log likelihood	-90.477816				
LR chi ² (11)	20.48				
Prob. > chi ²	0.0391				
Pseudo R ²	0.1017				
Correctly predicted	93.08%				
Independent Variables ⁽¹⁾	Estimated Coefficient	Std. Err.	z	p> z	Marginal Effect ⁽²⁾
GENDER	0.3580	0.4705	0.76	0.447	0.0176
AGE	0.3836*	0.2153	1.78	0.075	0.0188
HSIZE	0.1969	0.1991	0.99	0.323	0.0097
NET	0.1362	0.4312	0.32	0.752	0.0067
EDU	-0.2464	0.1757	-1.4	0.161	-0.0121
INCOME	0.6303**	0.3044	2.07	0.038	0.0309
ASSET	0.2297	0.1593	1.44	0.149	0.0113
INTR	0.0582*	0.0335	1.74	0.082	0.0029
COL	0.6601	0.5006	1.32	0.187	0.0324
DIST	0.0031	0.3141	0.01	0.992	0.0002
DUR	-0.5365**	0.2253	-2.38	0.017	-0.0263
_cons	-0.0414	1.4222	-0.03	0.977	

Note:

(1) Dependent Variable: 1 if households loan applications are accepted and 0 otherwise

(2) Marginal effects are in the mean value

***, **, * indicate the significance level at 1%, 5%, and 10%, respectively

Table 4-2 shows four variables significantly ($p < 0.10$) affect credit accessibility: age, income, interest rate and loan duration. Table 4-2 also depicts the marginal effects of each explanatory variable. Greene (2003) and Train (1986) advocate that the estimated logistic regression coefficient results obtained by maximum likelihood did not yield a direct interpretation, only the sign of each coefficient of the effect of independent variables. As a result, the marginal effects are used to predict the change of the predicted probability associated with the explanatory variables.

Age of borrower positively affects the probability of microcredit access ($z = 1.78$, significant at $p < 0.10$). In this current study, we classified the range of ages between 18-25 years coded as (1); 26-35 years as (2), 36-45 years as (3), 46-55 years as (4), 56-65 years as (5) and (6) for the respondents whose ages are above 65 years. This result supports the empirical findings of Li, et al. (2011a) who reveal that the age of borrowers affects the credit accessibility of rural households in China. Table 4.2 also shows a marginal effect of age at 0.019. This result indicates that as respondents' age increases by one unit in the age group, the probability to access microcredit would increase by 1.9%.

Household income positively affects credit accessibility ($z = 2.07$, significant at $p, 0.05$) which indicates that rural households with higher monthly incomes are more likely to access microcredit. A possible reason for this is that higher-income households exhibit more capability for loan repayments, leading to the probability of being microcredit borrowers. This result corresponds to other empirical studies (see for example, Evans, et al., 1999; Li, et al., 2011a; Mohamed, 2003). In addition, Table 4-2 reveals the marginal effect of monthly

income at 0.0309. This means that as the borrowers move up one level in monthly income group the probability of credit approval would increase by 3.1%.

Table 4-2 also shows the positive and significant effect of *interest rates* on credit accessibility ($z = 1.74$, significant at $p < 0.10$). This means that microcredit providers used interest rates to screen rural households as their borrowers. This is because rural borrowers who accept higher interest rates are potentially risk-taking borrowers. In other words, there is an *adverse selection* problem in credit accessibility of rural households in Bantul. This result also corresponds to the study by Gray (2006) who found that interest rates statistically and significantly affect the credit access to rural borrowers. Further, the marginal effect of interest rates is 0.0029, which indicates that rural households who accept 1% higher interest rates exhibit a higher probability of obtaining credit by 0.3%.

In contrast, Table 4-2 also reveals a negative and significant effect of *loan duration* on credit access ($z = -2.38$, significant at $p < 0.05$). This result implies that respondents who applied for shorter loan durations are more likely to be granted loans by the microfinance lenders. One of the potential explanation for this is that MFIs considered the unexpected risks perceived as possible during the microcredit term faced by rural borrowers. The marginal effect of loan duration is -0.026. This implies that as the borrowers apply for an additional unit of loan duration term, the probability of being accepted would decrease by 2.6%. This result confirmed the previous study in the Philippines by Gray (2006). In the empirical study of farmers and fisher-folk's credit accessibility, Gray argued that, formal MFIs tend to provide shorter-term loans because of the seasonality of agricultural activities (in order to minimize

credit risk). This is due to the fact that with longer loan terms, credit lenders would be exposed to a higher default risk of microcredit.

With regard to the *gender* of respondents, the results show a z statistic value of 0.76 and a p-value of 0.447. This means that the gender variable did not influence credit accessibility. This result implies that the gender of rural households did not affect the likelihood of becoming a microcredit borrower. A possible reason for this is that the gender of borrowers was not seen to determine the client's repayment capacity. Further, since microfinance has been introduced, the participation of Indonesian women in microcredit programmes has increased, particularly in family decision making and education of their children (Panjaitan-Drioadisuryo and Cloud, 1999). In this regard, male and female borrowers have the same opportunity to access microcredit in Indonesia. This finding contradicts Kashuliza and Kydd (1996) research, who showed a significant influence of the gender determinant in credit accessibility in Tanzania, especially in women's participation of microcredit.

Table 4-2 shows the z statistics and p-values for *household size* as 0.323 and 0.99, respectively. These results imply that MFIs did not consider household size as a key determinant when selecting their borrowers. Most of the microcredit lenders did not consider the number of family members as one of the credit approval criteria. One possible reason is that MFIs did not screen rural households based on the number of borrowers family member (household size). Moreover, our empirical results contradict the finding of Li, et al. (2011a), who found a significant correlation between household size and the likelihood of being microcredit borrowers.

Networking did not affect credit accessibility in the surveyed households. The empirical results reveal a non-significant, but positive, coefficient of networking variables ($z = 0.32$ and $p=0.752$). This means that the networking of respondents, such as relationships with credit officers, and local leader recommendations, did not affect the probability of accessing microcredit. One possible explanation for this is that microcredit providers opt to approve microloans as long as the borrowers meet the terms and conditions required by the MFIs. These results contradict previous research findings (see Coleman, 2006; Okten and Osili, 2004).

Table 4.2 shows that *educational attainment* is not a key factor influencing credit access for the surveyed households. The coefficient estimation result exhibits a negative and insignificant sign ($z = -1.4$ and $p = 0.161$). This result suggests that level of education did not affect rural household's participation in the microcredit market. One possible explanation for this is that with higher education attainment, rural households in Bantul can apply for more stable employment, leading to higher monthly incomes. As a result, more highly educated households who earn greater income opted not to borrow from MFIs.

There is a non-significant, but positive correlation between household assets and accessibility to credit. Table 4.2 shows that the z statistics and p -values of household assets were 0.149 and 1.44. The results reveal that the household assets of borrowers did not influence microcredit providers in approving loan applications. This suggests that assets of borrowers do not represent borrower's capability in credit repayment which is considered as determinant in gaining a credit provider's approval, even though assets of borrowers can be used as collateral substitutes for credit lenders (Mohamed, 2003). This finding contradicts

Li, et al's. (2011a), who state that the assets of borrowers were less likely to influence credit accessibility in rural households in China.

In terms of the *collateral* variable, our empirical results show the z statistic value and p-value as 0.187 and 1.32. In our analysis, we coded respondents who provided collateral, as 1, and without collateral, as 0. The results show a positive but non-significant correlation between collateral and credit acceptance. This result suggests that collateral is not a key factor influencing credit accessibility. One possible reason is that the surveyed respondents accessed an alternative "group lending" scheme which did not require collateral, such as Program Nasional Pemberdayaan Masyarakat (PNPM) programme. This national program in poverty reduction was officially launched in 2007. One of its initiatives is provision of capital and financial resources through revolving funds and microcredit for the poor in order to help the local economy. This programme is sponsored by the World Bank and implemented by the Ministry of Home Affairs¹⁰. This finding differs from Nagarajan and Meyer (1996)'s study in the Philippines, which suggested a correlation between collateral determinants and accessibility of microcredit.

In regard to the distance variable, the regression result shows no significant correlations between distance to nearest MFIs of respondents to accessibility to microcredit ($z = 0.01$ and $p = 0.992$). This finding implies that credit providers did not discriminate against borrowers based on their location. One possible reason for this is that there are numerous MFIs in the Bantul district providing microcredit for rural households which causes intense competition amongst credit lenders. As a result, MFIs did not take into account the borrowers' residency

¹⁰ Source: <http://www.worldbank.org/en/country/indonesia/brief/community-driven-development-in-indonesia>

for credit approval. Likewise, rural households did not consider distance to MFIs as long as their loan application was approved. This is because transportation in Bantul became relatively easy since every household was likely to have a motorcycle and there has been substantial roads development in recent years. However, this result contradicts a study in Ghana, which found that distance to the nearest MFIs significantly and positively influenced the credit accessibility of rural households (Ayamga, et al., 2007).

4.3. Empirical Results of Microfinance Welfare Impact

The multinomial logistic model (MNL) assesses the welfare impacts on borrowers after they received microcredit. The dependent variable in the model comprises the borrower's income, total assets and expenditure. In addition, each of the regression outcomes included "decrease", "no change" and "increase", where "decrease" was treated as the base outcome. The explanatory variables consist of the loan amount, age, marital status, household size, monthly income, household expenditure, occupation, education and purpose of loan. The results of the MNL regression also describes the Relative Risk Ratio (RRR) as the exponential coefficient measuring the odds ratio of choosing the outcome relative to the base outcome for a one-unit change in the independent variables (Menard, 2002).

4.3.1 Factors Influencing Household Monthly Income

This section discusses the empirical results of the MNL model to assess the impact of microcredit in terms of the borrowers' incomes. Table 4.3 shows that the MNL regression correctly predicts 71.10% of the outcomes. The log likelihood ratio test (Wald Chi-Square= 47.01, Pseudo R^2 = 0.0785, at $p < 0.01$) rejects the null hypothesis that all explanatory

variables in this model are equal to zero. This implies that the independent variables of the MNL model are satisfactory and the model can be used to explain the welfare impact of microcredit measured in terms of the income of borrowers.

Table 4-3: Results of Multinomial Logit Regression on Households' Monthly Income

No. of observations	365							
Log likelihood	-246.131							
Wald Chi-square	47.01							
Prob. > chi ²	0.0002							
Pseudo R ²	0.0785							
Correctly predicted	71.10%							
Base outcome: Decreased	No Change vs Decreased				Increased vs Decreased			
	RRR	RSE	z	p> z	RRR	RSE	z	p> z
AMOUNT	0.864	0.085	-1.48	0.139	1.220	0.281	0.86	0.390
AGE	1.140	0.137	1.09	0.278	2.236**	0.907	1.98	0.047
MAR	1.017	0.364	0.05	0.963	0.769	0.259	-0.78	0.436
HSIZE	1.080	0.120	0.69	0.492	1.086	0.341	0.26	0.792
INCOME	0.462***	0.130	-2.73	0.006	0.770	0.622	-0.32	0.746
EXPEND	1.852**	0.547	2.09	0.037	3.196*	2.143	1.73	0.083
OCCUP	1.037	0.072	0.52	0.600	0.782*	0.115	-1.67	0.095
EDU	0.996	0.100	-0.04	0.965	1.267	0.273	1.10	0.271
PURPOSE	1.287***	0.103	3.15	0.002	1.138	0.198	0.74	0.459
_cons	0.314	0.239	-1.52	0.127	0.000	0.000	-3.54	0.000

Note:

1. Estimation coefficients are presented in Relative Risk Ration (RRR) value

2. RSE: Robust Standard Error

***, **, * indicate the significance levels at 1%, 5%, and 10%, respectively

Table 4.3 shows four key factors that influence the income of borrowers accessing microcredit. The significant determinants include age of borrowers (AGE), monthly income of households (INCOME), household expenditure (EXPEND) and purpose of loan (PURPOSE). In terms of age, the result indicates that older borrowers have a higher probability of increasing their household income than younger borrowers. The RRR value shows that older

clients of MFIs have a 2.24 times (124%) probability of increasing their income relative to a decreasing household income. This result supports the findings in Malaysia by Samer, et al. (2015) and in Bangladesh by Rahman and Ahmad (2010). Rahman and Ahmad found that borrowers whose ages are 40 years and older have a higher probability of increasing their household income after accessing microcredit. Similarly, Samer, et al. also indicated that the age of credit borrowers have positive and significant effects on the household income in the impacts assessment of microfinance in Malaysia.

Based on Table 4.3, it is not a surprise that the income variable of the borrowers is also statistically significant affecting “no change” in clients’ incomes. The results (RRR = 0.462, at $p < 0.01$) show that a one-unit increase in income would lead to a 46.2% change of “no change” in income relative to the decreasing borrower’s income after accessing microcredit. This result confirms other empirical studies (see Doan, et al., 2010; Li, et al., 2011b). Those previous studies suggest that the average household’s income has remained the same as a direct result of microcredit program participation. Similarly, the monthly expenditure of borrowers also significantly affects the constant income of borrowers (RRR = 1.85 at $p < 0.05$). In addition, it is worth noting that the expenditure variable significantly influences increase in income of 3.2 times (120%) relative to a decrease in income (at the $p < 0.10$). This suggests that microcredit clients who spent more on their monthly expenditure are more likely to increase their income after borrowing from MFIs. In addition, the occupation variable significantly affects the increase in income of borrowers 0.78 times for rural households accessing microcredit ($p < 0.10$).

The purpose of the loan also exhibits a significant correlation with the income of the borrowers. Relative to a decrease in income, Tables 4.3 displays that the loan purpose variable exhibits “no change” in the borrower’s income (RRR = 1.287, at $p= 0.01$). This result suggests that credit used for income generating activities lead to stability of income after the borrowers received microcredit. These regression results confirm other studies in Indonesia, by Hawariyuni, et al. (2014), and in Bangladesh, by Khandker, et al. (1998). Hawariyuni, et al. (2014) have found that microcredit used for productive activities such as food selling businesses and furniture trading have significantly increased the income of the borrowers, while Khandker, et al. (1998) argued that microcredit programs have a significant impact on the borrowers in term of their income, especially credit as utilized in non-farm sectors.

4.3.2 Factors Affecting Total Household Assets

A second MNL regression empirically assesses the impact of the independent variables on the total assets of borrowers. Table 4.4 shows the model correctly predicts the estimated coefficients at approximately 70%. The log likelihood ratio test (Wald Chi-Square= 103.84, pseudo $R^2= 0.0762$, at $p = 0.01$) rejects the null hypothesis that all independent variables in this model are equal to zero. This implies the explanatory variables of the MNL model are satisfactory and the model can be used to explain the welfare impact in terms of the change in the borrower’s income.

Table 4-4: Results of Multinomial Logit Regression on Total Assets

No. of observations	362							
Log likelihood	-241.645							
Chi-square	103.84							
Prob. > chi ²	0.000							
Pseudo R ²	0.0762							
Correctly predicted	69.60%							
Base outcome: Decreased	No Change vs Decreased				Increased vs Decreased			
	RRR	RSE	z	p> z	RRR	RSE	z	p> z
AMOUNT	0.566**	0.125	-2.58	0.010	0.737	0.160	-1.41	0.160
AGE	1.824	1.356	0.81	0.419	1.798	1.330	0.79	0.428
MAR	0.463	0.282	-1.26	0.207	0.519	0.315	-1.08	0.280
HSIZE	0.612	0.308	-0.98	0.330	0.593	0.297	-1.04	0.297
INCOME	0.697	0.733	-0.34	0.732	1.158	1.209	0.14	0.888
EXPEND	3.670	2.992	1.59	0.111	2.138	1.722	0.94	0.345
OCCUP	0.673	0.248	-1.08	0.282	0.739	0.272	-0.82	0.412
EDU	3.108**	1.421	2.48	0.013	3.801***	1.737	2.92	0.003
PURPOSE	0.892	0.257	-0.40	0.692	0.872	0.254	-0.47	0.639
_cons	16.361	32.224	1.42	0.156	3.176	6.576	0.56	0.577

Note:

1. Estimation Coefficient are presented in Relative Risk Ratio (RRR) value
 2. RSE: Robust Standard Error
- ***, **, * indicate the significance levels at 1%, 5%, and 10%, respectively

Table 4.4 shows only two key factors influence the total assets of the borrowers. The significant determinants include loan amount (AMOUNT) and educational attainment (EDU). The MNL regression indicates that larger loans received by the borrowers positively and significantly affect the stability of the client’s assets relative to “decreasing” the assets of borrowers. The RRR value exhibits a probability of 56% (0.6 times) of “no change” assets relative to the “decrease” in assets if the borrowers are given a larger credit amount. Our result supports the findings by Hawariyuni, et al. (2014), which found that total loan amount provided to micro-borrowers significantly affected the impact of the borrowers’ assets.

According to Hawariyuni, et al., loan amount accessed by MFIs clients has increased household assets as the borrowers invest the microcredit to increase productivity of their small business such as buying new machinery on other fixed assets. However, other independent variables are non-significant in influencing the borrower's total assets after accessing microcredit.

The independent variables include age, marital status, household size, and income of borrowers, their monthly expenditure, occupation and purpose of their loan.

In terms of the education variable, Table 4.4 shows a strong correlation between educational attainment and total assets of borrowers. The results suggest that a higher educational level would lead to "no change" in assets and increase in assets relative to the "decrease" in assets. Table 4.4 shows results (RRR value=3.108, at $p=0.05$) that a unit change in educational level affects the "no change" in assets by 3.1 times.

Further, educational attainment is also a key determinant affecting the increase in borrower's total assets. The results imply that a one-unit change in educational attainment has the likelihood of increasing the assets of borrowers 3.8 times after accessing microcredit (at $p=0.01$). One potential reason for this is that higher educated borrowers are more likely to be knowledgeable in managing their small businesses and assets. This result corresponds to other empirical studies. Rahman, et al. (2014), demonstrated that level of education significantly influenced the "increase" in borrowers' assets in microcredit programmes in China. Rahman, et al. found that more highly educated borrowers tend to save their monthly

income and utilize their micro-loan by investing in income generating activities (such as purchasing livestock and poultry) leading to an increase in their household assets.

4.3.3 Factors Influencing Households' Monthly Expenditure

The last MNL model determines the impact of microcredit in terms of the borrower's expenditure. According to Table 4.5, this model correctly predicts 66% of the estimated coefficients. The log likelihood ratio test (Wald Chi-Square=29.59 Pseudo $R^2=0.0486$, at $p = 0.05$) rejects the null hypothesis that all independent variables in this model are equal to zero. This confirms that the explanatory variables of the MNL model are satisfactory and the model can be used to explain the welfare impact in terms of the borrower's expenditure.

Table 4-5: Results of Multinomial Logit Regression on Households' Monthly Expenditure

No. of observations	364								
Log likelihood	313.455								
Chi-square	29.59								
Prob. > chi ²	0.0417								
Pseudo R ²	0.0486								
Correctly predicted	66.00%								
Base outcome: Decreased	No Change vs Decreased				Increased vs Decreased				
	RRR	RSE	z	p> z	RRR	RSE	z	p> z	
AMOUNT	1.284**	0.164	1.96	0.049	1.184	0.152	1.31	0.190	
AGE	0.626**	0.137	-2.13	0.033	0.790	0.175	-1.07	0.285	
MAR	0.634	0.393	-0.74	0.462	0.790	0.470	-0.40	0.692	
HSIZE	1.115	0.208	0.58	0.559	1.185	0.222	0.90	0.366	
INCOME	0.717	0.351	-0.68	0.497	0.742	0.356	-0.62	0.534	
EXPEND	2.018	0.961	1.48	0.140	3.008**	1.445	2.29	0.022	
OCCUP	1.054	0.106	0.52	0.601	1.133	0.111	1.27	0.202	
EDU	1.009	0.221	0.04	0.967	1.070	0.238	0.31	0.760	
PURPOSE	1.067	0.187	0.37	0.712	1.145	0.193	0.80	0.424	
_cons	6.478	8.411	1.44	0.150	0.514	0.741	-0.46	0.644	

Note:

1. Estimation coefficients are presented in Relative Risk Ratio (RRR) value

2. RSE: Robust Standard Error

***, **, * indicate the significance levels at 1%, 5%, and 10%, respectively

Table 4.5 shows AMOUNT, AGE and EXPEND variables are significant (at $p < 0.05$) and positively affect household expenditure following access to credit. First, the loan amount (AMOUNT) is positive and significantly affects the “no change” in expenditure of the borrowers’ relative to decrease in expenditure (RRR= 0.049 and $p = 1.284$). This result indicates that borrowers who received larger credit amounts are more likely to maintain their monthly expenditure. These results confirmed a study on impact assessment in Malaysia by Saad and Duasa (2009) which found that the total amount of loan was the key factor influencing welfare impact of borrowers in term of their expenditure.

The second significant determinant variable is the AGE of borrowers. Table 4.5 shows the RRR values and p value of 0.033 and 0.626, respectively. This indicates that a one-unit increase in age would cause three times the likelihood of “no change” in the borrowers’ monthly expenditure. This finding confirms a study by Tedeschi (2008), which showed the age of borrowers significantly influences household expenditure after accessing microcredit in Peru.

Finally, household expenditure (EXPEND) exhibits a significant correlation in influencing the “increase” in monthly expenditure after accessing a micro-loan. Table 4.5 shows the results RRR = 3.008 and $p = 0.022$, at the 5% significance level. This implies that a one-unit increase in monthly expenditure would increase the probability of increasing the borrower’s monthly expenditure three times, when holding other factors constant. One possible reason is that the borrowers who access microcredit are more likely to expand their income generating activities. Hence, they likely to increase their monthly expenditure as a result of an increase in household living costs. These results corresponded to other empirical studies, such as Montgomery (2006) and Pitt and Khandker (1998). Using data survey in Bangladesh during 1991-1992, Pitt and Khandker (1998) result revealed that household expenditure significantly increased the borrowers spending, especially for female borrowers. In addition, Montgomery (2006) provided evidence that the monthly expenditure of borrowers has enabled MFIs’ clients to increase their expenditure on their children’s education in Pakistan.

4.4. Empirical Results Related to Clients and Non-Clients of Microcredit

A logit model is used to estimate the factors that differentiate MFI clients from non-clients in our study. The binary outcomes represent whether the borrowers used microcredit or did

not use microcredit (1=clients and 0=non-clients). There are nine explanatory variables used in this model, including gender (GEND), age of respondents (AGE), marital status (MAR), educational attainment (EDU), household income (INCOME), household expenditure (EXPEND), loan duration (DUR) and purpose of loan (PURPOSE). Overall, the model correctly predicts 86.27% of the respondents' client and non-client status. The likelihood ratio test with a chi-square of 19.06 ($p < 0.05$) leads to rejection of the null hypothesis that all variable coefficients are equal to zero. Therefore, the binary model can be used to explain the determinants differentiating clients and non-clients of MFIs in the surveyed area.

Table 4-6: Results of Logistic Regression on Clients/Non-Clients of Microcredit

Number of observations	488				
Log likelihood	-185.681				
LR chi ² (9)	19.06				
Prob. > chi ²	0.0247				
McFadden Pseudo R ²	0.0488				
Degrees of freedom	8				
% Correctly predicted	86.27%				
Independent Variables ⁽¹⁾	Coefficient	Std. Err.	z	p> z	Marginal Effects ⁽²⁾
GEND	0.177	0.296	0.60	0.549	0.020
AGE	0.252*	0.146	1.72	0.085	0.029
MAR	0.757**	0.376	2.01	0.044	0.086
EDU	-0.245**	0.122	-2.00	0.045	-0.028
OCCUP	-0.004	0.076	-0.05	0.959	-0.000
INCOME	0.387	0.279	1.39	0.166	0.045
EXPEND	-0.248	0.298	-0.83	0.407	-0.020
DUR	-0.004	0.151	-0.03	0.979	-0.000
PURPOSE	-0.073	0.087	-0.83	0.404	-0.008
_cons	0.390	0.896	0.44	0.663	

Note :

(1) Dependent Variable: 1 if households are clients of MFIs and 0 otherwise

(2) Marginal Effects are in the mean value

***, **, * indicate the significance levels at 1%, 5%, and 10%, respectively

The results displayed in Table 4.6 show that the gender of respondents did not significantly determine the probability of rural households becoming clients of MFIs. This finding is similar to a study in Ghana by Ayamga, et al. (2007), but contradict the studies of Okten and Osili (2004), and Sebopetji and Belete (2009), who found that gender significantly affects rural households' participation in microfinance programmes. Ayamga, et al. (2007) showed that the gender of borrowers is not a significant factor influencing microcredit participation in Northern Ghana, even though the a priori expectation was significant. An explanation for this is that in Northern Ghana, males usually control household resources such as land, labor and even farm output. Therefore, women borrowers in Ghana were usually credit constrained (Ayamga, et al., 2007). On the other hand, Okten and Osili (2004)'s study found that female borrowers significantly affect the probability of microcredit participation in Indonesia. Similarly, Chaudhary and Ishfaq (2003) have argued that female borrowers are more likely to participate in microcredit because they have more reliable repayment behavior than male counterparts in Bangladesh.

As hypothesised, the age of household is a significant factor affecting the likelihood of being clients of microcredit ($z = 1.72$ and $p = 0.10$). This result implies that older rural households are more likely to borrow microcredit than younger households. The result supports earlier empirical results (see Anggraeni, 2009; Wydick, et al., 2011). Anggraeni (2009) found that the age of borrowers is a key factor in determining clients of Rotating Savings and Credit Association in West Java, Indonesia, while Wydick, et al. (2011) argue that the age variable significantly affects rural households in Guatemala participation in microcredit programmes. The results in Table 4.6 also show the marginal effect of age variable as 0.029. This means a

one-unit increase in a client's age group increase the probability of being clients of MFIs by 2.9 %.

In terms of marital status, Table 4.6 shows that the coefficient of marital variable is statistically significant and affects the probability of the household decision in applying for microcredit ($z = 2.01$ and $p = 0.044$). This result can be interpreted to mean that rural households who are married are more likely to use microcredit. This result confirmed the study in South Africa by Sebopetji and Belete (2009), which found that married borrowers are more likely to participate in the microcredit program. In contrast, Nouman, et al. (2013) pointed out that the probability of being microcredit clients in Pakistan is affected by the marital status of borrowers. The authors revealed a negative and significant coefficient for marital status, which implies that married farmers are less likely to get a larger amount of credit compared to unmarried farmers. One possible reason for this is that married farmers are likely to have more stable incomes and thus demand less microcredit than unmarried farmers. Table 4.6 also shows the marginal effect of marital status as 0.086. This result indicates that a one-unit change in marital status, would lead to an increase in the probability of being a microfinance borrower by 8.6%.

Educational attainment is also a key factor discriminating between clients or non-clients of microcredit. As shown in Table 4.6, educational level significantly influences rural households in becoming credit borrowers ($z = -2.00$, and $p = 0.05$). The result can be interpreted to mean that the higher the educational level of households/respondents, the less likely they will use microcredit. One possible reason is that more highly educated households can easily access formal financial institutions sources which offer lower interest rates. This result confirmed similar empirical results by Ayamga, et al. (2007) in Ghana,

which found that the level of secondary education significantly influenced the probability of farmers decision to participate in the microfinance programs. Similarly, Vaessen (2001) argues that the probability of using microcredit is determined by the level of formal education in Northern Nicaragua. Table 4.6's results also display a marginal effect for education as -0.028. This means that an increase in educational attainment would decrease the probability of rural household becoming a microcredit borrower by 2.8%.

4.5. Summary

This chapter presents the descriptive statistics of the surveyed respondents. The empirical findings of the three regression models enable us to answer our research objectives and explain each of the determinant factors and the marginal effects of the significant factors. *First*, binary logistic regression is used to determine the accessibility of microcredit in the surveyed area in Bantul. The results of the binary logistic model show that *age of borrowers, monthly income, interest rates, and loan duration* are the key factors influencing the probability of loan approval in the surveyed respondents.

Second, the multinomial logit model is used to assess the determinants influencing welfare impacts of MFIs clients in terms of household income, household assets and expenditure. There are five significant variables that affect the welfare impact of microcredit in terms of the borrower's income. The explanatory variables include *age, monthly income, monthly expenditure, occupation, and loan purposes*. In contrast, the *amount of loan and educational attainment* significantly influence the welfare impact of the borrowers in terms of their total assets. Similarly, in terms of expenditure, clients' welfare impacts are significantly influenced by loan amount, age of borrowers and monthly expenditure.

Finally, to differentiate the clients and non-clients of rural households, the binary logit model is also employed. The model shows three significant determinants in determining the clients and non-clients of MFIs. The results indicate that age of the borrowers, marital status and educational achievement are key factors differentiating microfinance clients and non-clients in our study.

Chapter 5

CONCLUSION

This study emerged from the issues of credit accessibility and the impact of microcredit after accessed by rural households. Another reason for measuring the credit access is based on the fact that rural families in Indonesia are still lacking in accessing microfinance institutions. In addition, it is worth-noting that characteristics of rural households should be assessed to determine which are the potential clients of MFIs to expand the outreach of microfinance. In this regard, the chapter discusses the main findings, policy recommendations and future research for better implementation of microfinance in Indonesia.

5.1 Summary

This chapter provides a summary of this study, a review of the main findings and a conclusion based on the empirical results, policy recommendations, limitations of the study and suggestions for future research. The research objectives of the current study are: (1) to investigate the determinants of credit accessibility for Indonesian rural households; (2) to examine the welfare impacts of microfinance (microcredit) on rural households in Indonesia; (3) to identify the significant characteristics of rural household members who are both users and non-users of microcredit loans; and (4) to provide recommendations to Indonesian policy makers for better practices of microcredit in Indonesia.

Chapter Two presents an overview of microfinance from different contexts and the problems of credit accessibility faced by Indonesian rural households. A discussion on the

key determinants of microfinance accessibility and factors influencing welfare impacts of microcredit was also detailed.

Chapter Three details the research methodology, survey instruments, sampling design and data collection procedures used in the current study. Binary logistic model is employed to assess credit accessibility and to estimate the characteristics of clients or non-clients of microfinance. In addition, a multinomial logit model is used to test the welfare impact of microcredit borrowers in the surveyed location.

Chapter Four detailed the profile of respondents and the findings of the results from each regression model. The last part of the chapter provides the research conclusions, policy recommendations and suggestions for future research.

5.2 Main Findings

Two binary logistic models are used to estimate the first and third research objectives. In the first logit model, the regression results addressed factors influencing credit accessibility in Indonesia. The first regression results revealed that the age of borrowers (AGE), monthly income (INCOME), interest rates (INTR) and loan duration (DUR) are key variables that significantly affected the credit accessibility of rural households in Bantul.

The most obvious finding emerging from this model is that monthly income is a key determinant affecting the likelihood of being accepted for microcredit. The results suggest that rural households who increased their monthly income would have a higher probability (by 3.1%) of getting approval for their credit application. In addition, the logistic model

shows that older rural householders who applied for microcredit are more likely to have their credit approved. This is likely because older borrowers are more experienced and wiser about utilizing their credit in income generating activities which make them preferable to credit lenders. On the other hand, there are a considerable number of younger non-borrowers in the surveyed area. This means that there are opportunities for microfinance institutions to extend microcredit to younger borrowers.

In terms of interest rates, the model exhibits a positive and significant result, indicating that rural households who accepted higher interest rates have greater chances of credit acceptance, albeit the effect is moderate. In contrast, loan duration is found to be a negative and significant variable influencing credit access. This suggests that borrowers who asked for a longer credit duration are less likely to obtain microcredit. One possible explanation for this is that MFIs always consider the unexpected risks faced by rural borrowers during longer loan-terms in making their decision.

The second model used in this study is a multinomial logistic model. The model assesses welfare impacts on credit borrowers since they have been granted microcredit. The assessment relates to the credit impacts measured in terms of the borrowers' income, total household assets and changes in expenditure. In terms of household income, the results of the MNL model shows three key determinants that affect the increase in the borrower's income. The main factors include the age of borrowers (AGE), monthly expenditure (EXPEND) and occupation (OCCUP). Relative to a decrease in income, older credit borrowers exhibit significantly higher incomes than their younger counterparts after they had accessed microcredit (at the 5% significance level). Similarly, borrowers who have higher expenditure

per month would be inclined to have greater welfare impacts on their ability to borrow. This is because rural borrowers who have higher monthly expenditures are more likely to maximize their credit in income generating activities, leading to increase in their household income (Montgomery, 2006; Pitt and Khandker, 1998). In addition, the occupation variable significantly increases the borrowers' income by 78 % following their borrowing from MFIs (at the 10% significance level).

The MNL model also identified two significant variables that influence welfare impacts of microfinance in terms of the borrower's total assets. The results suggest that the larger amount of credit (AMOUNT) received by the borrowers would enable them to maintain their total assets compared to borrower's with decreasing assets. An interesting result of our MNL model is that the total assets would increase significantly if the borrowers have achieved a higher formal educational status, such as borrowers who graduated from high school or higher (at the 1% significance level). This result suggests that higher educated borrowers are more likely able to maximise the use of credit leading to increase in their total assets if credit is granted to those borrowers (Rahman, et al., 2014).

The MNL model also measures welfare impacts in term of the borrower's total expenditure. The results show that the loan amount (AMOUNT), the age of the borrowers (AGE) and household expenditure (EXPEND) are major factors influencing the welfare of microcredit borrowers. The MNL model results show that borrowers with larger loan amounts are more likely to maintain their monthly expenditure (Saad and Duasa, 2009). In addition, there is strong evidence supporting monthly expenditure as a key factor influencing the increase in

the borrower's expenditure. In other words, if the borrower spent more per month, he or she is more likely to increase his or her expenditure after obtaining microcredit.

For the third research objective, a binary logistic model is employed to identify determinants affecting the probability of being clients or non-clients of MFIs, estimating factors determining their participation as clients or non-clients. The binary logistic model reveals three significant determinants differentiating clients and non-clients of MFIs: the borrowers age (AGE), marital status (MAR) and educational attainment (EDU). In terms of the age of borrowers, the findings exhibit a significant and positive correlation between the age of households and the likelihood of being microcredit clients. The results indicate that older borrowers tend to become clients of MFIs. One possible explanation for this is that older households have better control over their household resources as they use microcredit in productive small business activities. More importantly, married householders have a greater probability of being clients of microcredit. This is because, in our surveyed study site, married borrowers are considered to have higher household incomes with two sources of income leading to their enhanced ability to repay a loan.

Finally, with regard to educational attainment, the result suggests that a higher level of educational attainment decreases the likelihood of being MFIs clients (at the 5 % significance level). One potential explanation for this is that more highly educated borrowers tend gain better employment and prefer to choose formal financial sources. This would make borrowing from MFIs unnecessary.

5.3 Policy Recommendations

This study proposes a number of policy recommendations to government agencies/policy makers and microfinance practitioners/MFIs who have concerns about microfinance development in Indonesia. *The first recommendation* is related to the age of borrowers. The findings revealed the significant impact of age on credit accessibility. Microcredit lenders tend to choose older borrowers rather than their younger counterparts. One possible reason for this is that older borrowers are presumed to be mature and more experienced in managing their businesses (Anggraeni, 2009). Hence, MFIs consider older borrowers to be more creditworthy. This implies that younger households suffered reduced microfinance access. To this extent, the policy makers should provide assistance to younger borrowers (e.g. basic skill training in business proposal, simple accounting report, and entrepreneurship management). In addition, MFIs might also consider focusing on the younger/start-up borrowers with supervision from field officers who have expertise and understand specific types of micro, small and medium enterprises (MSMEs). The purpose of this supervision would be to increase credit-worthiness of younger/start-up borrowers since MFIs regard them as low risk borrowers.

Second, this study reveals that MFIs preferred risk-taking borrowers who willingly accept higher interest rates (Gray, 2006). As a result, this will hinder non-risk taking borrowers who shy away from participating in microcredit. This leads to the issue of *asymmetric information* where microcredit lenders cannot identify who are good or bad borrowers. A possible approach in resolving this issue is for the government to continue efforts and build upon to preserve and back up the current microfinance insurance policy of Kredit Usaha Rakyat (KUR) / People's Business Credit (Finance Ministry, 2016). Credit insurance has been

implemented since the Indonesian Government launched Kredit Usaha Rakyat in 2008. This national programme has given a mandate to several state-owned banks and development regional banks (provincial owned-bank) to distribute small and soft loans to rural households (at 9% pa interest rates). The central government arranged for the Coordinating Ministry of Economic Affairs to provide funds for guarantee fees and claim (up to 70% of the loan value) through Asuransi Kredit Indonesia (Askrindo) and Jaminan Kredit Indonesia (Jamkrindo) in case the rural borrowers face credit default¹¹.

With regard to educational level, this study also found that microcredit lenders chose higher educated borrowers. Policy changes in response to this would be similar to the first recommendation; providing more practical assistance (e.g., information and technology training, and shared market information) to help less educated borrowers such that they would become more creditworthy to microcredit lenders.

Finally, in terms of loan duration, MFIs opted to select borrowers who applied for shorter loan terms. Many MFIs are concerned about the unexpected risks perceived to affect longer term loans by rural borrowers. To overcome this issue, microcredit insurance could be made available to MFIs to mitigate the risk of default by the borrowers. The credit insurance should be supported by central government fund (i.e. Askrindo and Jamkrindo). However, MFIs should also consider providing more diversified sources of funds, such as time-deposit products and saving accounts (e.g. Simpedes and Time Deposit of BRI). These products have enabled MFIs to become more resilient, sustainable and self-sufficient in making microcredit available to rural households (Seibel, 2009).

¹¹ Sources: www.askrindo.co.id and www.jamkrindo.co.id

5.4 Limitations of Study and Suggestions for Future Research

This study has several limitations. The *first limitation* is that the area of study only covered Bantul district in Yogyakarta, and thus limits our ability to generalise our results and findings. In addition, the length of field research was only two months (February – March 2016), which means that there was limited time to gather in-depth data from the rural households.

The *second limitation* lies with the impact assessment, which only measured MFI borrowers. In other words, there is no control group in measuring the welfare impacts of microcredit. This leads to the sample selection bias problem. To overcome this issue, using control groups is a way to avoid underestimation or overestimation in welfare impact assessment. Moreover, the MNL model was employed to assess the welfare impact of microfinance. This model has been widely used in empirical microfinance studies. The welfare impact measurement in our study includes three alternative outcomes (i.e. whether the outcomes: decrease, no change or increase). However, the weakness of the MNL model is that the model relies on an independence irrelevant assumption (IIA). The IIA assumption is a powerful assumption, and if it is violated the multinomial logit model may not be a good modelling choice for the current study (Hill, et al., 2008). The IIA assumption states that an individual choice of a certain alternative should be independent of the number of available alternatives. In other words, the odds of choosing a particular choice would not change when dropping or adding another option (Hill, et al., 2008; McFadden, 1973).

Further studies should employ *Different in Difference* (DID) methods, which are more popular in studies measuring welfare impacts. This method is widely used to measure

welfare impact of microcredit by comparing the impacts on both clients and non-clients of MFIs and between two periods of time (before and after accessing microcredit).

Future study should also take into account supply-side interviews with MFIs/microcredit lenders to investigate credit access in rural households. The purpose of investigating the supply-side sector is to get in-depth data for better impact assessment. The MNL model might also measure choices of financial sources accessed by rural households. Further, microfinance impacts studies should investigate different types of MFIs such as government aid program in several ministries (Agriculture and Fisheries), International Donors, Corporate Social Responsibility (CSR) fund and Islamic Microfinance Institutions. These non-bank MFIs have been serving microcredit for rural households in Indonesia with the same goal in poverty alleviation.

Appendix A : Cover Letter



Faculty of Agribusiness and Commerce

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F 64 3 325 3847

PO Box 84, Lincoln University
Lincoln 7647, Christchurch
New Zealand

www.lincoln.ac.nz

Dear Sir/Madam,

You are invited to participate in a survey that constitutes part of my Master of Commerce and Management thesis at Lincoln University, New Zealand. This is a part of my research project titled "Credit Accessibility: The Impact of Microfinance on Indonesia Rural Household". The purpose of this research is to investigate accessibility to microfinance and its impact on Indonesia rural households.

This research is completely voluntary in nature and you are free to decide not to participate at any time during the process of completing the questionnaire and without prejudice, including withdrawal of any information you have provided. However, if you complete the questionnaire and return it to me, it will be understood that you are 18 years of age or older and have consented to participate in this survey and consent to publication of the results of this research with the understanding the anonymity will be preserved.

Your participation is of great assistance to this research. This survey will take maximum 45 minutes to complete. I would be grateful if you would complete the questionnaire and return it to me once you have finished. I will return to collect the completed survey.

Complete anonymity is assured in this survey, as the questionnaire is anonymous. No questions are asked which would identify you as an individual. All responses will be aggregated for analysis only, and no personal details will be reported in the thesis or any resulting publications.

If you have any question about this survey, feel free to contact me on +62 897-8315-677 or by email at danangbudi.santoso@lincolnuni.ac.nz. You can also contact my supervisors Dr. Christopher Gan and Dr. Cuong Nguyen. Dr. Christopher Gan can be contacted at +64 3 423 0227 or Christopher.Gan@lincoln.ac.nz ; and Dr. Cuong Nguyen can be contacted at +64 3 423 0245 or Cuong.Nguyen@lincoln.ac.nz. This project has been reviewed and approved by the Lincoln University Human Ethics Committee. Thank you for your kind co-operation and assistance.

Yours sincerely,

Danang Budi Santoso

Master student of Commerce and Management

Research Supervisors:

Dr. Christopher Gan

Professor

Faculty of Agribusiness and Commerce

Department of Financial and Business Systems

Lincoln University

Dr. Cuong Nguyen

Lecturer

Faculty of Agribusiness and Commerce

Department of Financial and Business Systems

Lincoln University

Appendix B: Letter To Local Government

Faculty of Agribusiness and Commerce
T 64 3 423 0000 • F 64 3 325 3847
PO Box 85084, Lincoln University
Lincoln 7647, Christchurch, New Zealand
www.lincoln.ac.nz



February 14, 2016

To Whom It May Concern:

This is to certify that Mr. Danang Budi Santoso is a student at Lincoln University, New Zealand. He is undertaking his Masters study in Agribusiness and Commerce and his research is titled "Credit Accessibility: The Impact of Microfinance on Indonesia Rural Household". The purpose of this research is to investigate accessibility to microfinance and its impact on Indonesia rural households.

As a part of the research, Mr. Danang is required to survey rural households in Bantul District, Yogyakarta Province, Indonesia. In addition, he will also conduct interview with rural households who reside and access microfinance institutions in Bantul District.

In order to undertake the survey, Mr. Danang needs your assistance and support in term of research permits and other relevant information. Your support and assistance would be much appreciated.

Please contact me if you have questions concerning Mr. Danang's research.

Sincerely,

A handwritten signature in black ink, appearing to be "Chris", written over a horizontal line.

Dr. Christopher Gan
(Thesis Supervisor)
Professor in Accounting and Finance
Faculty of Agribusiness and Commerce
Department of Financial and Business Systems
Lincoln University

New Zealand's specialist land-based university

4. What was the percentage share from each source? (The sum of these sources of financing adds up to 100%)

Formal finance		Informal finance	
a. Commercial banks (i.e: BRI Unit, Mandiri Mikro, BPD Mikro)	[]	a. Private money lender	[]
b. Rural Banks (i.e: BPR, Bank Pasar)	[]	b. Friends/relatives	[]
c. Development Assistant Fund	[]	c. Trade credit (with business partners or customers)	[]
d. Microfinance institutions	[]	d. Pawnshops	[]
e. Others (Please specify.....)		e. Others (Please specify.....)	

5. How would you describe your business?

- a. Agriculture (incl.: Fishing, Forestry and Livestock) []
- b. Small trader (such as petty trader, small restaurant, street vendor) []
- c. Waste management and recycling []
- d. Food and beverage home industry []
- e. Apparel and garment home industry []
- f. Handicraft making (such as leather goods, furniture and ceramics) []
- g. Services (such as rice milling, barbershop, beauty salon)
- h. Others, please specify _____

6. Did you apply for microcredit in the last 2 years?

- a. YES []
- b. NO []

If YES, please continue to section 1.1, if NO please go to section 1.2

Section 1.1 Clients of MFIs

7. Which of the following microfinance institution(s) did you borrow in 2014? (You may choose more than one)

- a. Commercial banks (BRI Unit, Mandiri Mikro, BPD Mikro) []
- b. Rural banks (BPR, Bank Pasar) []
- c. Cooperatives (KSP, KSP Syariah, BMT) []
- d. Other(s), please specify _____

8. Did you get approval of your loan application from the microfinance institutions?

- a. YES []
- b. NO []

If YES, continue to Q.9, if NO please skip to Q.10

9. Why did you choose this microfinance institution? (You may choose more than one)

- a. This was the regular financial institution for microcredit loan []
- b. This was the only microcredit supplier in my area []

- c. Other credit suppliers would reject my application []
- d. This microcredit supplier offers the lowest interest rate []
- e. This microcredit supplier offers the best credit terms and conditions []
- f. Other(s) please specify _____

Now please go to Q.11

10. If No in Q.8, what were the reasons why your loan application was rejected? (You may choose more than one)
- a. I did not have any collateral []
 - b. There was no recommendation from bank staff /local leader []
 - c. Bad credit histories []
 - d. Uncertain monthly income []
 - e. I did not have a bank account []
 - f. Other(s), please specify _____

Now, skip to Section 3.

11. How long have you been a borrower of your microfinance institution?
- a. Less than 1 year []
 - b. 1 to 2 years []
 - c. 2 to 3 years []
 - d. 3 to 4 years []
 - e. Other(s) please specify _____

12. How many times did you borrow from the microfinance institution since 2014?
- a. Once []
 - b. Twice []
 - c. Three times []
 - d. More than three times []

13. What is the maximum single amount of microcredit loan you can borrow from the microfinance institution?
- a. Less than IDR 1,000,000.00 []
 - b. From IDR 1,000,001.00 to IDR 2,500,000.00 []
 - c. From IDR 2,500,001.00 to IDR 5,000,000.00 []
 - d. From IDR 5,000,001.00 to IDR 10,000,000.00 []
 - e. From IDR 10,000,001.00 to IDR 15,000,000.00 []
 - f. More than IDR 15,000,001.00 []

14. Was the loan amount you have received adequate?
- a. YES []
 - b. NO []

If YES, please skip to Q.17; if NO, please continue to Q.15

15. If inadequate, did you borrow from other credit sources?
- a. YES []
 - b. NO []
- If YES, please continue to Q.16; if NO, please skip to Q.17

16. If yes in Q.15, where did you find your other loan / additional credit?

Formal finance		Informal finance	
a. Commercial banks (i.e: BRI Unit, Mandiri Mikro, BPD Mikro)	[]	a. Private money lender	[]
b. Rural Banks (i.e: BPR, Bank Pasar)	[]	b. Friends/relatives	[]
c. Development Assistant Fund	[]	c. Trade credit (with business partners or customers)	[]
d. Microfinance institutions	[]	d. Pawnshops	[]
e. Others (Please specify.....)		e. Others (Please specify.....)	

17. Approximately how far is your distance to the nearest microfinance institution in your township?

- a. less than 5 km []
- b. between 5 km to 10 km []
- c. between 10 km to 20 km []
- d. more than 20 km []

18. What was the interest rate you paid for the microcredit loan in 2014? (% p.a)

19. Is this a fixed rate or variable rate loan?

- a. Fixed rate []
- b. Variable rate []

20. Is your loan collateralized?

- a. Yes []
- b. No []

21. If yes, what type of collateral(s)? (You may choose than one)

- a. Land's Title (Sertifikat Hak Milik /SHM) []
- b. Housing properties / Sertifikat Hak Guna Bangunan (SHGB) []
- c. Equipment capital (i.e., vehicles, farm equipment) []
- d. Personal belongings (such as car, motorcycle, gold, stocks, etc.?) []
- e. Deposits / Savings []
- f. Others (specify.....) []

22. When you applied for credit, did you use recommendation?

- a. Yes []
- b. No []

23. If yes, which types (s) of recommendation did you use? (You may choose more than one)

- a. Families []
- b. Bank Staff / Loan officers []
- c. Local leaders []
- d. Other(s), please specify _____

24. What is the purpose of your loans? (You may choose more than one)

- a. Expanding business, manufacturing, trading, or service activities []
- b. Buying car / motorcycle []
- c. Emergency needs []

- d. Social needs []
- e. Daily consumptions []
- f. Financing new small project(s) []
- g. Paying other debts []
- h. Others (please specify.....) []
25. How long is your loan duration?
- a. Less than 6 months []
- b. 6 months to 1 year []
- c. 1 to 2 years []
- d. 2 to 3 years []
- e. More than 3 years []
26. What is the repayment mode of your loan?
- a. Weekly []
- b. Monthly []
- c. Semi-annually []
- d. Annually []
- e. Other(s), please specify _____
27. How long did the microcredit bank takes to process your loan application? (from your application submitted until received loan)
- a. Less than a week []
- b. 1 week []
- c. 2 weeks []
- d. 3 weeks []
- e. 1 month []
- f. More than a month []
28. Do you have any savings in your microcredit bank?
- a. YES [] b. NO []
- If YES please go to Q.29; if NO please skip to Q.30
29. If yes in Q.28, how much is your current saving in your microcredit bank account?
- a. Below IDR 1,000,000.00
- b. Between IDR 1,000,001.00 and 2,500,000.00
- c. Between IDR 2,500,001.00 and IDR 5,000,000.00
- d. Between IDR 5,000,001.00 and IDR 10,000,000.00
- e. More than IDR 10,000,001.00
30. Did you get charged for microcredit fees?
- a. YES [] b. NO []
31. If yes, what kind of fees you were charged? (You may choose more than one)
- a. Administrative or service fee []
- b. Insurance fee []
- c. Legal fee []
- d. Other(s), please specify _____

32. Did you face any difficulties for your loan repayment in the last loan cycle?
 a. YES [] b. No []

If YES please continue to Q.33, if NO please skip to Q.35

33. If "Yes" in Q.33, how many times did you miss your repayment?
 a. Once []
 b. 2 times []
 c. 3 times []
 d. 4 times []
 e. More than 4 times []

34. What caused your repayment problems? (You may choose more than one)
 a. Failure on crop farming []
 b. Sickness (I and/or family members) []
 c. Inflation / economic shocks (fuel price increase) []
 d. Other, please specify _____

35. Would you continue borrowing money from this microfinance institution?
 a. YES [] b. NO []

If YES, please continue to Q.36; if NO, please skip to Q.37

36. Identify the reason(s) you like most about the microfinance institution. (You may choose more than one)
 a. Lower interest rate than other informal lenders []
 b. Steady source of working capital []
 c. Group solidarity and/or group dynamics []
 d. Training or technical assistance []
 e. Efficiency as compared to banks or other sources []
 f. Easier guarantees than loan alternatives []
 g. Professionalism of credit officers or staff []
 h. Other(s) please identify _____

Now, please go to Q.38

37. If "No" in Q.35, what are the reasons?(You may choose more than one)
 a. Higher interest rates or fees []
 b. Size of loans too small []
 c. Loan duration too short []
 d. Dislike the group leader []
 e. Dislike the weekly meeting []
 f. Not able to meet weekly loan repayment schedule []
 g. Transaction costs (slow disbursement, etc.) []
 h. Dislike behavior/attitude of loan officer []
 i. Long distance to the nearest microfinance institutions branches []
 j. Other(s) please specify _____

38. What kind of productive assets do you have? (You may choose more than one)
 a. Farm lands / buildings []
 b. Livestock (cattle/goat/buffalo) []

- c. Agricultural machineries (hand-tractor, harvesting machines, etc.) []
- d. Car / Motorcycles []
- e. Other(s), please specify _____

39. What kind of house do you live in?

- a. Own house []
- b. Shared house with parents / relative []
- c. Rent house []
- d. Other, please specify _____ []

40. What kind of household assets do you owned? (You may choose more than one)

- a. Car []
- b. Motorcycle []
- c. Bicycle []
- d. Jewelry (such as gold and silver) []
- e. Household appliances (TV, radio, etc.) []
- f. Other(s), please specify _____

41. Did you receive any assistance from the government, NGOs, or aid agencies such as the United Nations in the last 2 years?

- a. YES []
- b. NO []

If YES, please continue to Q.42; if NO, please go to Section 2.

42. If Yes in Q.41, what kind of assistance did you receive?

- a. Cash subsidies from government / Bantuan Langsung Tunai []
- b. Inputs of agricultural production (e.g., fertilizer, seeds) []
- c. Subsistence support (e.g., rice, milk) []
- d. Interest-subsidized loans (not micro loans) []
- e. Other(s) please specify _____

NOW, PLEASE GO TO SECTION 2

Section 1.2. Non-Clients of MFIs

43. Do you have any intentions to borrow in the future?

- a. YES []
- b. NO []

If YES, continue to Q.44; if NO, please skip to Q.45

44. If Yes in Q.43, which financial institutions would you borrow from? (You may choose more than one)

Formal finance		Informal finance	
a. Commercial banks (i.e: BRI Unit, Mandiri Mikro, BPD Mikro)	[]	a. Private money lender	[]
b. Rural Banks (i.e : BPR, Bank Pasar)	[]	b. Friends/relatives	[]
c. Development Assistant Fund	[]	c. Trade credit (with business partners or customers)	[]
d. Microfinance institutions	[]	d. Pawnshops	[]
e. Others (please specify.....)	[]	e. Others (please specify.....)	[]

NOW, PLEASE GO TO SECTION 3

45. If No in Q.43, why not? (You may choose more than one)

- a. Enough savings/other sources []
- b. Direct Government Aid / Bantuan Langsung Tunai (BLT) []
- c. Afraid to borrow []
- d. Interest rates were too high []
- e. Unstable income for repayment []
- f. Other(s) please specify _____

NOW, PLEASE GO TO SECTION 3

SECTION 2

Welfare impacts of microfinance (microcredit) (Only for Microcredit Clients)

46. Did your total household income increase after borrowing from the microfinance institution(s) in the last 2 years?

- a. Increased []
- b. Remained the same []
- c. Decreased []

47. If "Decreased" in Q.46, what are the reasons? (You may choose more than one)

- a. Failure on crop farming []
- b. I or family members got sick []
- c. Losing jobs / income earners []
- d. Inflation / economic shocks (fuel price increase) []
- e. Other, please specify _____

48. Please state your household assets after borrowing microcredit loan in the last 2 years?
Please tick (X) in the blank space.

Assets	Increased	Decreased	No Change
Land / housing			
Home Appliances			
Farm / Livestock Assets			
Total Household Assets			

49. If your total household assets “Decreased” in Q.48, what are the reasons? (You may choose more than one)

- a. Liquidated some of fixed assets []
 b. Poor harvest (flood, drought) []
 c. Low market price of farming products []
 d. Livestock price decrease / died []
 e. Other(s) please specify _____

50. Please state your household expenditures after borrowing from microfinance institution(s) in the last 2 years? Please tick (X) in the blank space.

Expenditures	Increased	Decreased	No Change
Food Expenditures			
Schooling Expenditures			
Health Care Expenditures			
Total Households Expenditures			

51. If your total household expenditure “Decreased” in Q.50, what are the reasons? (You may choose more than one)

- a. Household members have been decreased []
 b. I planted vegetables and raise livestock for consumption []
 c. Children have graduated and started to work []
 d. My children education is free (subsidized) []
 e. Government subsidized for health insurance / BPJS []
 f. My employer covered for health insurance []
 g. Others (please specify) _____

52. With microcredit loan, I am more optimistic about the future?

- a. Agree [] b. Disagree []

53. If “Agree” in Q.52, what are the reasons? (You may choose more than one)

- a. Microcredit loan improves my household welfare []
 b. Microcredit loan helps me accumulate household assets []
 c. Microcredit loan increases my financial security []
 d. Others _____

54. If “Disagree” in Q.52, what are the reasons? (You may choose more than one)
- a. Microcredit loan is insufficient for household income []
 - b. Microcredit loan contributes only a small percentage to household expenditure []
 - c. It is hard to be positive in the current economic condition []
 - d. Others _____

NOW, PLEASE GO TO SECTION 3

SECTION 3

Demographic and Socio-economic Characteristics
(for All Respondents)

55. What is your gender?
- a. Male []
 - b. Female []
56. Which age group do you belong to?
- a. 18 – 25 years olds []
 - b. 26 – 35 years olds []
 - c. 36 – 45 years olds []
 - d. 46 – 55 years olds []
 - e. 55 – 65 years old []
 - f. Over 65 years olds []
57. What is your marital status?
- a. Single/Never Married []
 - b. Married []
 - c. Widow / Widower []
 - d. Divorced/Separated []
58. How many income earners in your household?
- a. 1 []
 - b. 2 []
 - c. More than 2 []
59. How many dependents live in your household?
- a. 1 member []
 - b. 2 members []
 - c. 3 members []
 - d. More than 3 []
60. What is highest education level you have completed?
- a. No formal education []
 - b. Primary School []
 - c. Secondary / Junior High School []
 - d. High School []
 - e. College / Vocational []
 - f. Bachelor []

- g. Postgraduate []
61. What is your occupation?
- a. Crop farmer []
 - b. Fisherman []
 - c. Factory worker []
 - d. Seasonal worker/casual jobs []
 - e. Small entrepreneur []
 - f. Public Servant / Army / police []
 - g. Retired []
 - h. Unemployed []
 - i. Other (please specify) _____ []
62. How long have you been working?
- a. Less than 1 year []
 - b. Between 1 and 3 years []
 - c. Between 3 and 5 years []
 - d. Between 5 and 10 years []
 - e. More than 10 years []
63. Does your household have any subsidiary income?
- a. YES []
 - b. NO []
- If YES please go to Q.64; if NO please skip to Q.65
64. If yes, what is the source(s) of your household subsidiary income? (You may choose more than one)
- a. Property renting []
 - b. Street vendor (e.g., groceries, snacks, soft drink, etc.) []
 - c. Recycles materials (e.g., bottles, boxes, etc.) []
 - d. Government assistance/aids []
 - e. Remittance from other family member []
 - f. Other(s), please specify _____ []
65. What is your currently monthly household income?
- a. Less than IDR 330,776.00 []
 - b. Between IDR 330,776.00 and IDR 1,163.800.00 []
 - c. Between IDR 1.163,800.00 and IDR 5,000,00.00 []
 - d. More than IDR 5,000.000.00 []
66. What is your currently monthly household expenditures?
- a. Less than IDR 330,776.00 []
 - b. Between IDR 330,776.00 and IDR 1,163,800.00 []
 - c. Between IDR 1,163,800.00 and IDR 5,000,000.00 []
 - d. More than IDR 5,000.000.00 []

Your participation in this survey is greatly appreciated. Thank you for your time and if you have further comments about microcredit access and its welfare impacts, please feel free to comment in the space provided below. Once again, we assure you that your identity will remain STRICTLY CONFIDENTIAL.

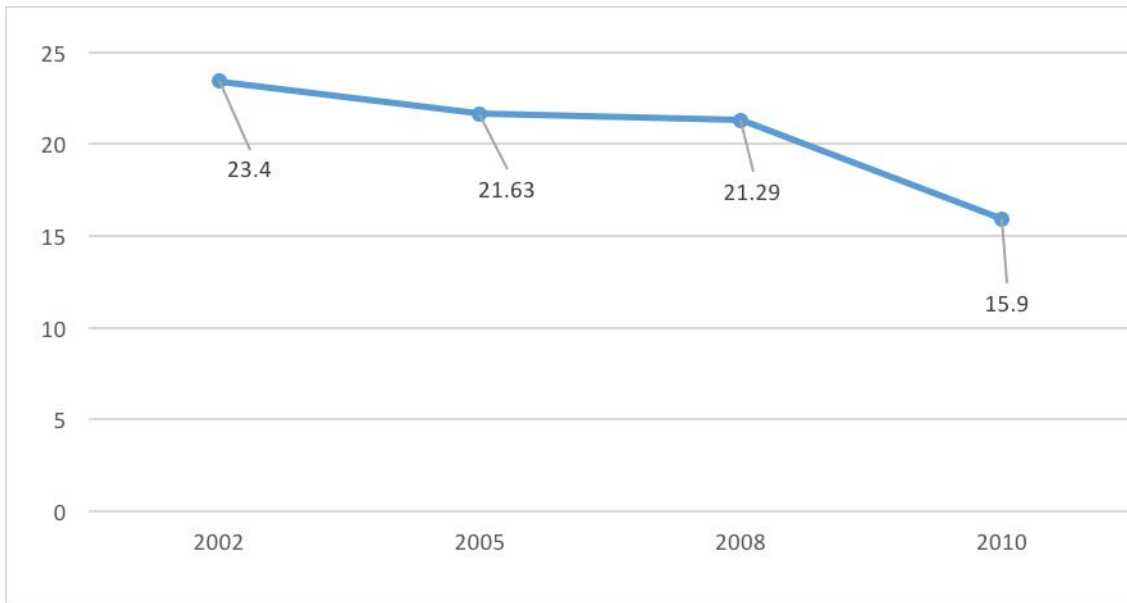
Appendix D: Independent Variables Description

NO	VARIABLE NAME	DESCRIPTION OF VARIABLES	MEAN	STANDARD DEVIATION
1	Individual Characteristics			
	Gender	Dummy Variable of Gender taking the values: 1 = male 0 = female	0.3709016	0.4835419
	Age	Categorical of Borrower's Age taking the values: 1=18-25 years; 2=26-35 years; 3=36-45 years; 4=46-55 years; 5=56-65 years; 6= above 65 years	3.040984	1.08677
	Marital Status	Categorical of Marital Status taking the values: 1=Single/Never Married; 2=Married; 3=Widow/Widower; 4=Divorced/Separated	1.965164	0.4308622
	Educational Level	Categorical of Educational Level taking the values: 1=Non-formal; 2=Primary; 3=Secondary; 4=High School; 5=College; 6=Bachelor; 7=Postgraduate	3.961066	1.207659
	Occupation	Categorical Occupation taking the values: 1= Crop farmer; 2= Fisherman; 3= Factory worker; 4= Seasonal worker/casual jobs; 5= Small entrepreneur; 6= Public Servant/ Army/police; 7= Retired; 8= unemployed; 9= others	4.569672	1.948849
	Loan Amount	Categorical of Loan Amount taking the values: 1= < IDR 1,000,000.00; 2= IDR 1,000,001.00 to IDR 2,500,000.00; 3= IDR 2,500,001.00 to IDR 5,000,000.00; 4= IDR 5,000,001.00 to IDR 10,000,000.00; 5= IDR 10,000,001.00 to IDR 15,000,000.00; 6= > IDR 15,000,001.00	3.28436	1.359297
	Distance to Nearest MFIs	Categorical of the distance to nearest taking the values: 1=< 5Km; 2=5 – 10 Km; 3=10-20 Km; 4 = >20 Km	1.450237	0.6865781
	Collateral	Dummy variable of Collateral taking the values: 1= with collateral, 0=otherwise	0.5331754	0.4994903
	Networking	Dummy Variable of Networking taking the values: 1= with networking; 0=otherwise	0.6432039	0.4796363
	Purpose of Loan	Categorical of Loan Purposes taking the values: 1=Expanding business, manufacturing, trading, or service activities; 2=Buying car / motorcycle;	1.919811	1.577976

		3=Emergency needs; 4=Social needs; 5=Daily consumption; 6=Financing new small project(s); 7=Paying other debts; 8=Others		
	Loan Duration	Categorical of Loan Duration taking the values: 1= < 6 months; 2=6 months – 1 year; 3=1 – 2 years; 4=2-3 years; 5= more than 3 years	2.647059	1.005948
2	Household Characteristics			
	Household Size	Categorical of Household Size taking the values: 1 =1 member; 2=2 members; 3=3 members; 4=more than 3 members	2.538934	1.067785
	Household Income	Categorical of Household Income taking the values: 1=< IDR 330,776.00; 2=IDR 330,776.00 - IDR 1,163.800.00; 3=IDR 1.163,800.00 - 5,000,000.00; 4=> IDR 5,000,000.0	2.534836	0.7011399
	Household Expenditure	Categorical of Household Expenditure taking the values: 1=< IDR 330,776.00; 2=IDR 330,776.00 - IDR 1,163.800.00; 3=IDR 1.163,800.00 - 5,000,000.00; 4=> IDR 5,000,000.0	2.393443	0.6542532
	Household Assets	Categorical of Household Assets taking the values: 1=Farm lands / buildings; 2=Livestock; 3= Agricultural machineries; 4= Car / Motorcycles; 5=Others	2.383372	1.398048

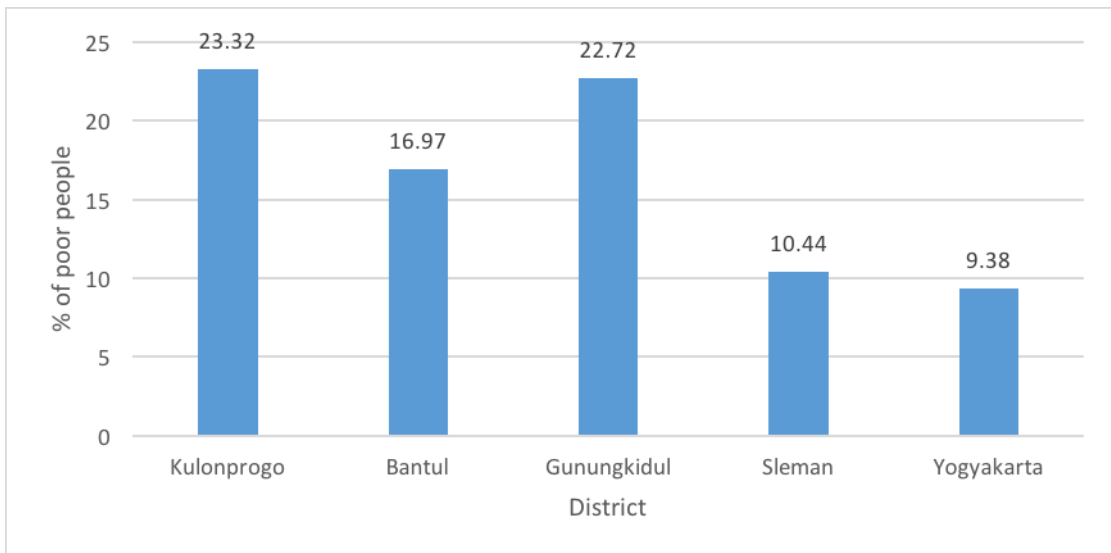
Appendix E: Statistic of Rural Households in Indonesia and Bantul District

Figure 1: Indonesian Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population)



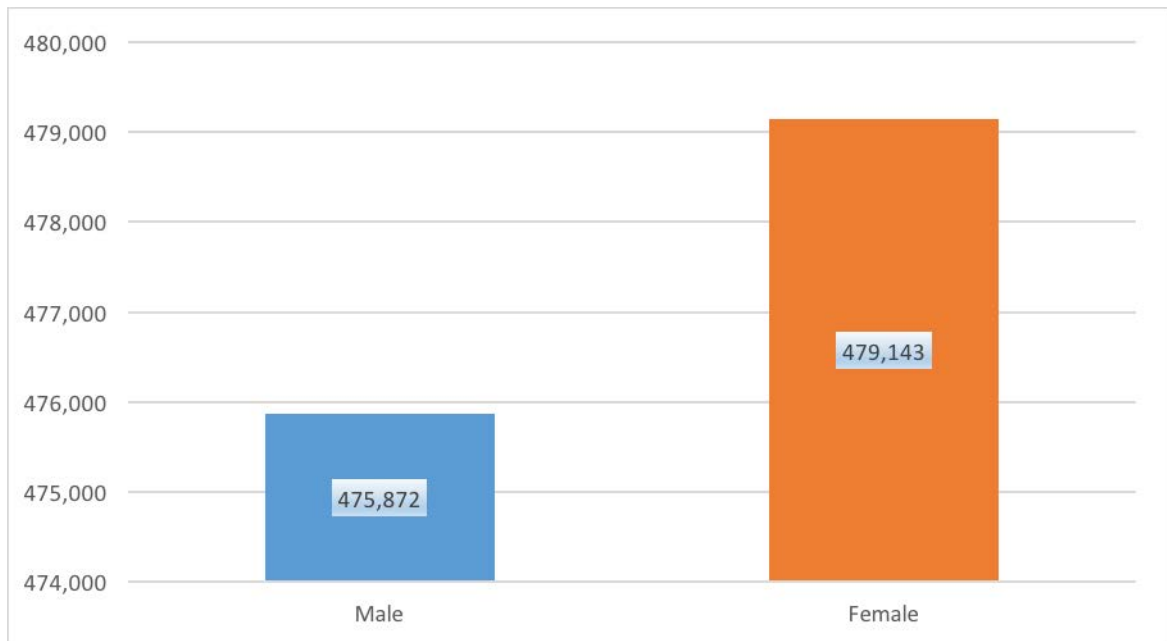
Source: World Bank, accessed date: June 1, 20016

Figure 2: Poverty Line by District in Yogyakarta Province, Indonesia in 2012



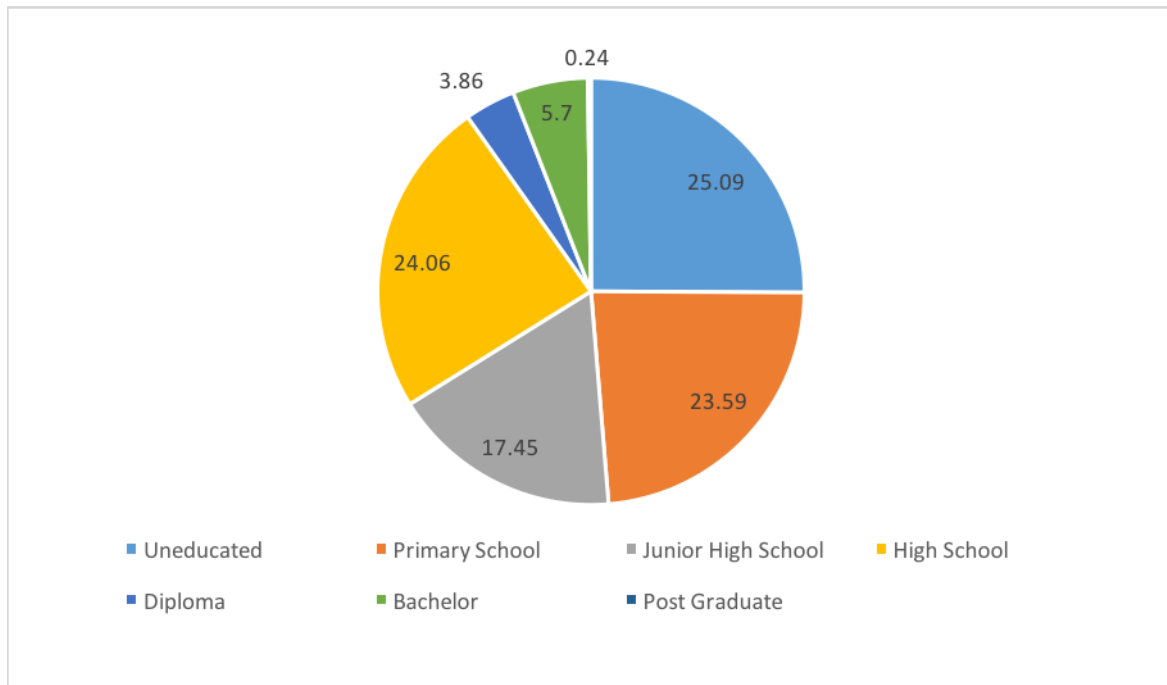
Source: National Socio-Economics Survey, BPS-Statistics of D.I. Yogyakarta Province

Figure 3: Bantul Population by Gender (2010-2020)



Source: BPS-Statistics of Bantul District

Figure 4: Education Attainment in Bantul District as 2009 (%)



Source: www.bantulkab.go.id

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