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Microcredit Accessibility in Rural Households: Evidence from Indonesia

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Microcredit Accessibility in Rural Households: Evidence from Indonesia

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Abstract

Extant literature suggests that microcredit may improve borrowers' social and economic welfare. This study aimed to investigate the microcredit accessibility of rural households in Indonesia. Binary Logistic regression was used to distinguish the characteristics of microcredit borrowers and non-borrowers, and the factors affecting the approval of microcredit application. Primary data was collected through a survey on 488 rural households in Bantul, Yogyakarta. The empirical results suggested that age, marital status and education attainment significantly affect the characteristics of clients and non-clients of microcredit. The results also revealed that age of borrowers, household income, interest rates, and loan duration are key determinants affecting microcredit accessibility. The implications of the findings were provided.
Keywords: microfinance; microcredit access; Indonesia; logit model

JEL classifications: G21; G18; H81

1. Introduction

1.1. Background

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 (Quinones & 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, Gan, & Hu 2011a).

Amidst worrying reports about poor households who live under the poverty line[1], microfinance programs for poverty alleviation has been burgeoning in developing countries, such as in Bolivia,

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[1] Based on the World Bank definition, the poverty line is defined as people who are living on less than US$1.90 a day at 2015 international prices (purchasing power parity / PPP). Source: http://data.worldbank.org.

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 activities (see for example, Hermes & Lensink 2011, Saad & Duasa 2011, 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 & 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).

1.2. Research Problem

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 & 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

[2]Source: World Bank Data - http://data.worldbank.org/country/indonesia.

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bank failures by promulgating a series of regulatory reforms. Inevitably, these reforms also changed Indonesian's microfinance outlook, which became larger and centralized 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 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 standardizing 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 centralization of operations, and a preference for standard loan products and delivery systems (Rosengard & Prasetyantoko 2011).

Rosengard and Prasetyantoko (2011) have argued that the financial sectors in Indonesia are currently characterized 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 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.

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

1. What are the characteristics of rural household members who use microcredit loans versus those who do not use microcredit loans in Indonesia?
2. What are the determinants of credit accessibility to rural households in Indonesia?
3. What are the best practices of microfinance programs for the policy decision makers?

There will be two contributions of this paper. First, the study will identify the determinants affecting microcredit accessibility of rural households in Indonesia, bridging the gap in the Indonesian microfinance literature by using an empirical approach comprising a field survey and a structured questionnaire. Second, 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.

The paper is organized as follows. Section Two details the literature review. Section Three explains the empirical models used to answer the research objectives. This is followed by the data collection procedures, the sampling and survey design. Section Four details the descriptive statistics and regression results for the empirical models. Finally, Section Five summarizes of the main research findings, proposes policy recommendations, gives the limitations of the study and provides suggestions for future research.

2. Literature Review

2.1. 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 1). Furthermore, the Indonesian Financial Authority (OJK) advises that microcredit providers should focus their microcredit programs or services on the unmet credit demands which, in a large part, have been served by commercial bank or formal Financial Institutions (FIs).

2.2. 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 moneylenders and pawn-brokers, carried out mostly by the Chinese and Arabs (Robinson 2002, Revindo & Gan 2017a).

There are two major institutional providers of MFIs services in rural areas: the government-owned Bank Rakyat Indonesia (BRI), with some 3,500 subbranches (*unit desa*) at the sub-district level, and some 9,000 formal and semi-formal MFIs (Seibel & Parhusip 1998). Based on Prawiranata (2013) and the Banking With The Poor (2013), the types of MFIs in Indonesia can be categorized as banks and non-banks (see Table 1).

Indonesian MFIs mostly target rural households as their clients. One of the state-owned banks which predominantly serves micro-lending to rural households in Indonesia is Bank Rakyat Indonesia (BRI).

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

Category	Banks		Non-Banks	
	Conventional	Islamic	Conventional	Islamic
State owned banks	1. State-owned Banks: - Based on Act No. 10/1998 - Government shares - Supervised by Financial Authority	1. State Owned Banks: - Based on Act No. 10/1998 - Government shares - Supervised by Financial Authority Service (OJK) Example: - BRI Syariah - Mandiri Syariah - BTN Syariah	1. Cooperatives: Based on Cooperatives Act No. 25/1992 Supervised by Ministry of Cooperatives and MSME's Example: - Koperasi Simpan Pinjam	1. Islamic Cooperatives: Based on Cooperatives Act No. 25/1992 Supervised by Ministry of Cooperatives and MSMEs Example: - Baitul Maal wa Tamwil (BMT)
or Cooperatives				
Commercial Banks	2. Commercial Banks	2. Islamic Commercial Banks - Based on Act No. 10/1998	2. Pawnshops Divided into:	n/a*
or	- Based on Act No. 10/1998	- Private companies	a. State-owned: Perum Pegadaian (PP)	
	- Private companies	- Supervised by Financial Authority Service (OJK)	b. Private Pawnshops	
Non-formal MFIs	- Supervised by Financial Authority Service (OJK) Example: - Danamon Simpan Pinjam - BTPN	Example: - Danamon Syariah - BTPN Syariah		
Rural Banks	3. Rural Banks:	3. Islamic Rural Banks:	3. Money-lenders, Arisan (self-help group): They are not regulated by the government and charge very high interest rates for borrowers.	n/a
	- Based on Act No. 10/1998	- Based on Act No. 10/1998		
or	- Private companies - Supervised by Financial Authority Service (OJK)	- Private companies - Supervised by Financial Authority Service (OJK)		
Non-formal MFIs	- Coverage area: district level/municipal Example: - Bank Perkreditan Rakyat (BPR)/Rural Conventional Banks - Village Funds and Credit Institutions (Badan Kredit Desa)	- Coverage area: district level/municipal Example: BPR Syariah		

Source: Adapted from Prawiranata (2013)
* n/a: not available

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 IDR24.038 trillion (distributed to more than 11.326 million clients[3]). 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 1). Those MFIs comprise formal, semi-formal and informal financial institutions that have been operating in the rural areas as providers of microcredit. Arsyad (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).

2.3. 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, which was also common in other developing countries, especially in Asia (see for example Seibel & Rachmadi 2009, Revindo & Gan 2017b, 2017c, Lebovics, Hermes, & Hudon 2016, Wijesiri, Viganò, & Meoli 2015).

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 in Indonesia. 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 households[4]. 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 & 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

[3]Data from http://komite-kur.com/article-103-sebaran-penyaluran-kredit-usaha-rakyat-periode-november-2007-november-2014.asp.

[4]Source: www.bi.go.id.

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(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 (World Bank 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.

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, Higashikata, and Takahashi (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 recognized 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.

3. Method

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.

3.1. Identifying Borrowers and Non-borrowers of Microcredit

This is to test the socio-demographic attributes of rural households who did or did not use microcredit. The logit model is used, since the dependent variable $(\mathrm{Y_{in}})$ represents two groups of credit borrowers. The binary outcome of $(\mathrm{Y_{1n}})$ represents microfinance clients and non-clients of microfinance. The general parametric functional expression of this model can be given as follows:

$$\mathrm{Y_{1n}} = \ln\left(\frac{\mathrm{P_i}}{1-\mathrm{P_i}}\right) = \mathrm{Z_i} \qquad (1)$$

where $\mathrm{Y_{in}}$ is credit borrowers (where 1= use microcredit; 0 = do not use microcredit) and $\mathrm{Z_i}$ is a set of explanatory variables and the error terms. Table 2 depicts the explanatory variables and the expected a priori sign used in equation above.

The independent variables comprise of *gender*, *age of consumers*, *marital status*, *educational achievement*, *occupation*, *household income*, *expenditure*, *loan duration*, and *purpose of loan*. The positive and significant coefficients are hypothesized 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 & Ishfaq

Table 2: 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	(+)

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, Gan, and Hu (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, Gan, and Hu (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 hypothesized 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. 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 re-

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jected. 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 & Kydd 1996, Li, Gan, & Hu 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 analyze 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 & Ishfaq 2003, Li, Gan, & Hu 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 parametric functional form can also be written as follows:

$$\mathrm{Y}^{*}_{\mathrm{ln}} = \ln\left(\frac{\mathrm{P_i}}{1-\mathrm{P_i}}\right) = \mathrm{Z_i} \qquad (2)$$

Where $\mathrm{Y}^{*}_{\mathrm{in}}$ = Decision on microcredit application, (where 1= approved and 0= rejected); $\mathrm{P_{in}}$ = the probability of choices and $\mathrm{Z_i}$ is a vector of explanatory variables and the error terms. Table 3 depicts the explanatory variables used in equation 7 and the expected a priori sign of the variables.

Previous empirical studies by Li, Gan, and Hu (2011a), Sarap (1990), Tang, Guang, Z., and Jin (2010), Vaessen (2001), and Wydick, Hayes, and Kempf (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, Gan, and Hu (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, Gan, and Hu (2011a), and Wydick, Hayes, and Kempf (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, Gan, & Hu 2011a, Mohamed 2003).

Table 3: 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)	(+)

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 & 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 & 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 hypothesized 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.

3.3. Data Collection Procedure

3.3.1. Sampling Design

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

$$\mathrm{n} = \frac{\mathrm{z}^2\mathrm{pq}}{\mathrm{e}^2} \tag{3}$$

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 $1 - \mathrm{p}$. This study used the 95% (or $\pm$5% pre-

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cision) level of confidence and assumed $\mathrm{p} = 0.5$ and $\mathrm{q} = 0.5$. 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° 44' 04" - 08° 00' 27" south latitude and 110° 12' 34" - 110° 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, respectively[5]. Among those residents, there are 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)[6].

3.3.2. 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 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.

3.3.3. 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

[5]Data from: https://bantulkab.go.id/datapokok/1001_lembaga_keuangan.html.

[6]Data from: http://perindagkop.bantulkab.go.id/.

were then coded, entered into Excel, and imported into STATA 13 software for analysis.

4. Results

4.1. Profile of the Respondents

Table 4 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.

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

Overall, the binary logit model correctly predicts 86.27% of the respondents' client and non-client status. The likelihood ratio test with a chi-square of 19.06 ($\mathrm{p} < 0.05$) 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.

The results displayed in Table 5 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. (2006), 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 programs. Ayamga et al. (2006) 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. 2006). 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 hypothesized, the age of household is a significant factor affecting the likelihood of being clients of microcredit ($\mathrm{z} = 1.72$ and $\mathrm{p} = 0.10$). 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, Hayes, and Kempf 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, Hayes, and Kempf (2011) argue that the age variable significantly affects rural households in Guatemala participation in microcredit programs. The results in Table 5 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 5 shows that the coefficient of marital variable is statistically significant and affects the probability of the household decision in applying for microcredit ($\mathrm{z} = 2.01$ and $\mathrm{p} = 0.044$). 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

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

Characteristics of the Respondents	Non-Applicants ($n_1 = 97$)		Applicants ($n_2 = 391$)		All respondents ($n = 488$)		Statistical Test
	n	% of n_1	n	% of n_2	n	% of n	
Individual Characteristics							
Gender							
Female	62	63.9	245	62.7	307	62.9	X^2 = 0.053
Male	35	36.1	146	37.3	181	37.1	p=0.05
Age group							
18–25 year-olds	11	11.3	16	4.1	27	5.5	X^2= 13.77**
26–35 year-olds	32	33	100	25.6	132	27	p=0.05
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	X^2=14.05***
Married	73	75.3	348	89	421	86.3	p=0.01
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	X^2 =10.15
Primary School	4	4.1	42	10.7	46	9.4	p=0.05
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	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	X^2 =18.43**
Fisherman	2	2.1	4	1	6	1.2	p=0.05
Factory worker	15	15.5	63	16.1	78	16	
Seasonal worker/casual jobs	6	6.1	28	7.2	34	7	
Small entrepreneur	32	33	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	
Working duration							
Less than 1 year	11	11.3	25	6.4	36	7.4	X^2 =6.47
Between 1 and 3 years	24	24.7	69	17.6	93	19.1	p=0.05
Between 3 and 5 years	21	21.6	90	23	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	
Household Characteristics							
Number of income earners in household							
1 earner	33	34	113	28.9	146	29.9	X^2 =1.044
2 earners	48	49.5	213	54.5	261	53.5	p=0.05
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	X^2 =0.29
2 members	28	28.9	105	26.9	133	27.3	p=0.05
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	X^2 =3.47
IDR 330,777.00 - IDR 1,163,800.00	47	48.5	155	39.6	202	41.4	p=0.05
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	X^2 =3.06
IDR 330,777.00 - IDR 1,163,800.00	51	52.6	198	50.6	249	51	p=0.05
IDR 1,163,801.00 - IDR 5.000.00.00	33	34	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

Table 5: 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

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 5 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 5, educational level significantly influences rural households in becoming credit borrowers ($\mathrm{z} = -2.00$ and $\mathrm{p} = 0.05$). 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. (2006) 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 5'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%.

4.3. Empirical Results Related to Credit Accessibility

Among the 390 respondents, 362 households' (92.8%) credit applications were granted, while 28 respondents (7.2%) were not granted. Logistic regression analysis is used to identify the household factors influencing credit accessibility. This empirical approach is used to capture the binary outcome

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of loan applications: accepted or rejected by the microfinance institution (coded as 1=accepted or 0=otherwise). Overall, the model correctly predicts 92.82% of credit accessibility. The likelihood ratio test exhibits a significant ($\mathrm{p} < 0.01$) chi-square of presumably 20.48 (pseudo $\mathrm{R}^2 = 0.1017$, significant $\mathrm{p} < 0.05$) 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 6 shows four variables significantly ($\mathrm{p} < 0.10$) affect credit accessibility: age, income, interest rate and loan duration. Table 6 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 ($\mathrm{z} = 1.78$, significant at $\mathrm{p} < 0.10$). 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, Gan, and Hu (2011a) who reveal that the age of borrowers affects the credit accessibility of rural households in China. Table 6 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 ($\mathrm{z} = 2.07$, significant at $\mathrm{p} < 0.05$) 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, Gan, & Hu 2011a, Mohamed 2003). In addition, Table 6 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 6 also shows the positive and significant effect of *interest rates* on credit accessibility ($\mathrm{z} = 1.74$, significant at $\mathrm{p} < 0.10$). 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 6 also reveals a negative and significant effect of *loan duration* on credit access ($\mathrm{z} = -2.38$, significant at $\mathrm{p} < 0.05$). 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 previ-

Table 6: 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	0.358	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	14.222	-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 levels at 1%, 5%, and 10%, respectively

ous 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 programs has increased, particularly in family decision making and education of their children (Panjaitan-Drioadisuryo & 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 6 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. On 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, Gan, and Hu (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 ($\mathrm{z} = 0.32$ and $\mathrm{p} = 0.752$). This means that the networking of respondents, such as relationships with credit officers, and local leader

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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 & Osili 2004).

Table 6 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 ($\mathrm{z} = -1.4$ and $\mathrm{p} = 0.161$). 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 6 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, Gan, and Hu'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) program. 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 program is sponsored by the World Bank and implemented by the Ministry of Home Affairs[7]. 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 ($\mathrm{z} = 0.01$ and $\mathrm{p} = 0.992$). 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 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

[7]Source: http://www.worldbank.org/en/country/indonesia/brief/community-driven-development-in-indonesia.

et al. 2006).

5. Conclusion

This study emerged from the fact that rural families in Indonesia are still lacking in accessing microfinance institutions. Two binary logistic models are used. In the credit accessibility model, the binary logit regression addressed factors influencing credit accessibility in Indonesia. The 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.

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 households 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 is unnecessary.

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 bor-

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rowers. 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 program has given a mandate to several state-own 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 default[8].

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 & Rachmadi 2009).

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 generalize our results and findings. In addition, the length of field research was only two months (February–March 2016), which means that that there was limited time to gather in-depth data from the rural households.

[8]Sources: www.askrindo.co.id and www.jamkrindo.co.id.

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.

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