RE-EVALUATING THE EFFECTS OF MICROFINANCE IN THE PHILIPPINES

A Dissertation

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Abstract

The first analytical chapter of this dissertation examines whether the substitutability (complementary) role of microfinance is correlated with decreased (increased) likelihood and amount of credit that households demand from informal lenders. Multivariate probit and seemingly unrelated regression models are applied using nationally representative data collected in the Philippines. Results indicate that microfinancing is a substitute of informal lending by both moneylenders, and relatives and friends. Moreover, households with microfinance loans are found to less likely borrow from other formal financial institutions. However, results on the likelihood of poor or female-headed household borrowing suggest that microfinance providers neither substitutes nor complements informal lenders.

While I draw robust findings on microfinancing as substitute of informal lending, little is known if it is welfare improving. The second analytical chapter investigates if access to microfinance improves household income and consumption as well as raises engagement in self-employment activities using a household-level panel data and the unique event of microfinance-oriented banks (MOBs) opening in 2004. We find an average positive effect on education and negative effect on wage work for households with short-term exposure to MOBs, but these effects materialize only after the closure of the respective MOBs. When MOBs offer households longer access to microfinance, the effects diminish or even regress. Heterogeneity analysis further reveals that women and non-poor households gain more from MOB presence. Overall, MOB presence is not sufficiently transformative to lift the poor out of poverty. Nevertheless, it reduces vulnerability as it affords households means to be entrepreneurs and invest more in human capital.

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To my selfless mother, ***Carolina***

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List of Abbreviations

AONCR	Areas Outside NCR
ADB	Asian Development Bank
BSP	Bangko Sentral ng Pilipinas
CARP	Comprehensive Agrarian Reform Program
CDA	Cooperative Development Authority
CFS	Consumer Finance Survey
DCP	Direct Credit Program
DID	Difference-In-Differences
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
EA	Enumeration Area
EIU	Economic Intelligence Unit
FE	Fixed Effects
FIES	Family Income and Expenditure Survey
GRIPS	National Graduate Institute For Policy Studies
GSIS	Government Service Insurance System
IIA	Independence of Irrelevant Alternatives
IPW	Inverse Probability Weighted
MCPI	Microfinance Council of the Philippines
MFI	Microfinance Institutions
MOB	Microfinance-Oriented Bank
NCR	National Capital Region
NGO	Non-Government Organization
NHA	National Housing Authority
OFW	Overseas Filipino Workers
PDIC	Philippine Deposit Insurance Corporation

PHP	Philippine Peso
PSA	Philippine Statistics Authority
PSGC	Philippine Standard Geographic Code
PSU	Primary Sampling Unit
RSBS	Retirement and Separation Benefits
SSS	Social Security System
SUR	Seemingly Unrelated Regression
UPAO	Urban Poor Affairs Office
USD	United States Dollar

Chapter 1

Background and Motivation

1.1 Microfinance and Informal Lending

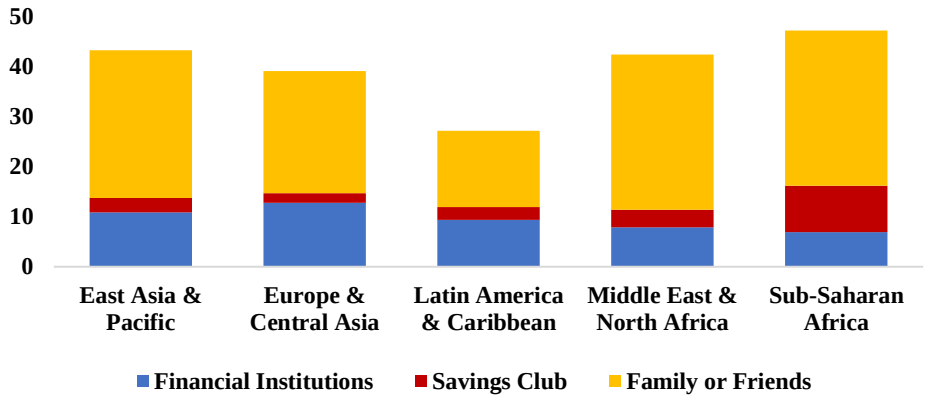
For decades, creating opportunities for the poor has been a central topic in development discussions. In 2015, world leaders agreed to the United Nations' 17 Sustainable Development Goals, among which Goal 1 is "ending poverty in all its forms everywhere." However, effective strategies for the reduction of poverty have been elusive.

Microfinancing has been promoted as a means of alleviating poverty by improving provision of savings, credit, and insurance to the poor, particularly women, who make up a significant proportion of the poor. Microfinance loans are provided in small amounts at low interest rate offering new ways of smoothing consumption and income, better risk management and asset accumulation, and establishment of microenterprises (Asian Development Bank [ADB], 2000). However, it remains unclear whether microfinance does in fact deliver on its promises.

Many of the poor continue to borrow informally in particular, from moneylenders, and relatives and friends, even if the areas have a high concentration of formal finance. Extensive outreach (e.g., offered door-to-door, in the workplace, or in the marketplaces), flexible payment arrangements, and personalized relationship with borrowers make informal lenders accessible to individuals who are denied of formal financial services. Figure 1.1 shows that in 2017, in all geographic regions in the world, family or friends was the primary

source of credit for individuals aged 15 and above, and that an average of 26.28 percent of adults borrowed from family or friends compared to 9.60 percent from financial institutions.

Figure 1.1 Credit Sources: By Geographic Regions of the World
(As of End-2017, In Percent)



Source of Data: World Bank Database on Global Financial Inclusion
Note: No data available for Central and South America

A national strategy for microfinance in the Philippines was drafted in 1997 by the National Credit Council [1] under the Department of Finance in response to the poor performance of direct credit programs (DCPs). DCPs were implemented from the early 1960s to the 1990s in order to provide credit to the poor, using public funds at subsidized interest rates (Microfinance Council of the Philippines [MCPI], 2011). The national strategy made the microfinance industry a viable mainstream provider of financial products and services to the poor. Additionally, it steered government agencies away from direct participation in the credit market and encourage private institutions such as banks, cooperatives, and non-government organizations (NGOs) to venture into microfinance (MCPI, 2011).

[1] Created in 1993 to develop a credit delivery system that will encourage private participation in the delivery of credit, especially to the poor.

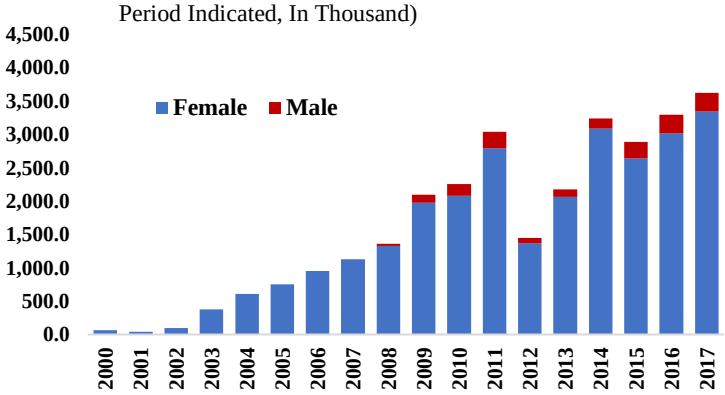
Table 1.1 presents selected microfinance sector information for the year 2017, culled from the World Bank Mix Market and Cooperative Development Authority (CDA) database. There are 121 microfinance providers in the Philippines, catering to more than 5.2 million active borrowers. Among those microfinance providers, NGOs have the largest number of institutions providing microcredit and financing enterprises, but microfinance banks offer larger loans, each for PHP 1,411.13 (USD 28.00). There was no World Bank data available on amount of outstanding loans on cooperatives. Nonetheless, it is worth mentioning that the statistics published by the CDA report 8,946 multipurpose and credit cooperatives serving more than 8.6 million members, multipurpose and credit cooperatives being the two types of cooperatives that offer microfinance products and services in the Philippines.

Most microfinance borrowers are female, live in rural areas, and borrow to finance microenterprise and individual consumption (Figures 1.2a to 1.2c). Table 2.11 to 2.13 show that microfinance providers also offer individual loans such as micro-agri, housing, education, health, emergency, personal, or consumer loans at zero to 20.0 percent annual interest rate. Compulsory deposit (2.0 to 20.0 percent of loan amount) is required by some microfinance providers that can be withdrawn at the end of or during the loan term. Microfinance providers perceive this mandatory savings as collateral substitute that reduces their risk exposure but at the expense of their client's ability to access their savings.

Figure 1.2d shows that the physical reach of microfinance providers has been generally increasing. While microfinance has gradually emerged as an alternative source of finance for the poor, informal lenders and relatives and friends are still important credit providers (Figure 1.3).

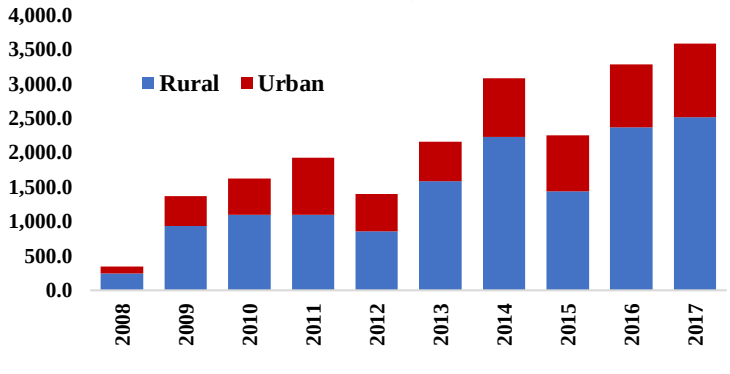
Figure 1.2: Client and Loan Portfolio of Selected 121 Microfinance Providers in the Philippines

(a) Number of Active Borrowers: By Gender (As of End-Period Indicated, In Thousand)



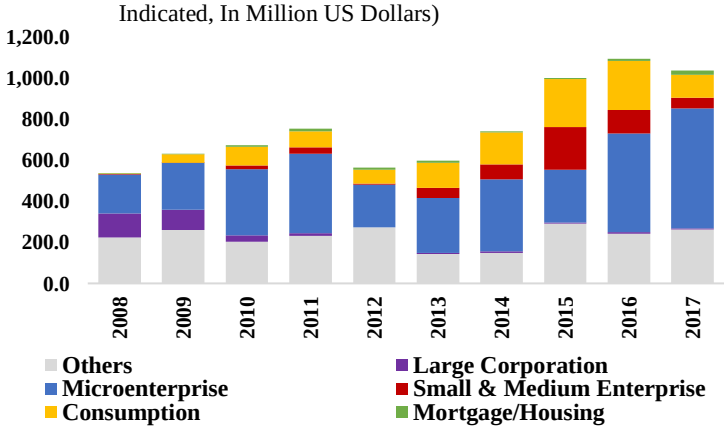
Source of Data: World Bank Database on Mix Market

(b) Number of Active Borrowers: By Location (As of End-Period Indicated, In Thousand)



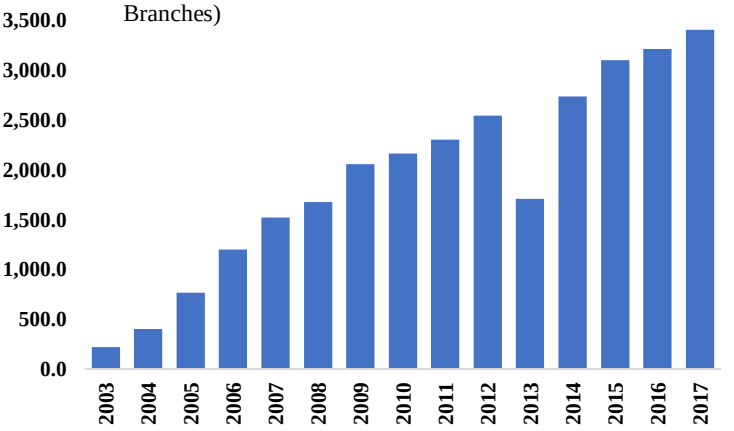
Source of Data: World Bank Database on Mix Market

(c) Gross Loan Portfolio: By Purpose (As of End-Period Indicated, In Million US Dollars)



Source of Data: World Bank Database on Mix Market

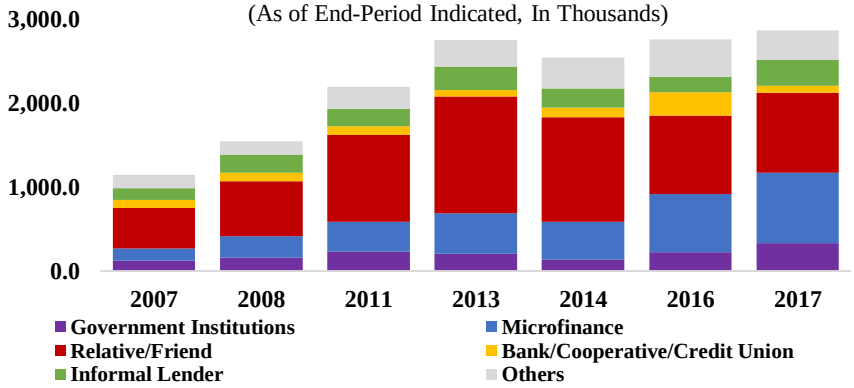
(d) Physical Outreach (As of End-Period Indicated, Number of Branches)



Source of Data: World Bank Database on Mix Market

Figure 1.3: Bottom 30% Income Households Who Availed Loan in the Philippines: By Source

(As of End-Period Indicated, In Thousands)



Source: Annual Poverty Indicator Survey; Philippine Statistics Authority

Note: Government institutions comprised of Social Security System, Pag-ibig, and Government Service Insurance System

Adams & Fitchett (2019) explain that this is possible since funds from informal borrowing often find their way to banks and bank loans circulate through informal channels. For example, landlords, professional moneylenders, shopkeepers, and traders acquire bank funds that are in turn used to finance their informal credit businesses (Madestam, 2014). For that reason, the effectiveness of microfinance as tool for reducing household borrowing from informal sources remains questionable.

1.1.1 First analytical chapter: Objectives, contributions, and main findings

The first analytical chapter (Chapter 2) examines whether microfinance providers have *substitutive* or *complementary* relationship with informal lenders and other formal financing institutions. More specifically, using nationally representative data collected in the Philippines, Chapter 2 investigates the *substitutive* or *complementary* role of microfinance providers in terms of the likelihood (extensive margin) of household borrowing and the amount (intensive margin) of funds borrowed. It is important to distinguish between extensive and intensive margins because the former is a good indicator of access to credit while the latter measures the extent of credit demand. Furthermore, informal lenders are classified into two categories, moneylenders and relatives and friends. It is necessary to examine the influence of microfinance providers on household borrowing from moneylenders separately to borrowing from relatives and friends as the two sources have distinct attributes that affect the presence and outreach of microfinance.

A multivariate probit model is then used to estimate the likelihood of household borrowing while a seemingly unrelated regression (SUR) is utilized to determine the extent

of credit demand. A multivariate probit model is employed because it relaxes independence of irrelevant alternatives (IIA) that could be too restrictive, and also to account for simultaneous borrowing by one household from multiple credit sources. The *substitutability* and *complementarity* roles of microfinance providers are identified by the correlation of the error terms among microfinance providers, moneylenders, relatives and friends, and other formal lenders in the multivariate probit and SUR models.

Briefly, the results presented in Chapter 2 suggest that microfinance providers are *substitutes* for moneylenders and relatives and friends; they cater to collateral-poor or self-employed households who are also clients of moneylenders and relatives and friends. However, results on the extensive margin of poor or female-headed households indicate that microfinancing neither substitutes nor complements household borrowing from moneylenders and relatives and friends.

Microfinance providers as *substitutes* for moneylenders and relatives and friends do not necessarily guarantee improved household welfare. For instance, Banerjee, Karlan and Zinman (2015), Crèpon, Devoto, Duflo and Parienté (2015), Attanasio, Augsburg, De Haas, Harmgart and Meghir (2015), Karlan and Zinman (2011) fail to find significant positive impact of microfinance on aggregate consumption. Moreover, Karlan and Zinman (2011) observe that in the Philippines expanded access to microloans shrinks business scale. A re-investigation of whether households' access to microfinance is welfare-improving is beyond the scope of Chapter 2, but the second analytical chapter addresses the issue.

1.2 Institutionalization of Microfinance in the Philippines

The findings of previous studies on microfinance indicate that it can increase income, smooth consumption, foster business creation, decrease vulnerability, enhance better education, health and housing, and improve the economic and social situation of women. For instance, Hulme and Mosley (1996), in their study of Indonesia, India, Bangladesh, and Sri Lanka, provide evidence of a positive impact of microfinance on average income. Agbola, Acupan and Mahmood (2017) find evidence that in Northeastern Mindanao, Philippines, microfinance improves educational attainment. Banerjee et al. (2015) see an increase in business profits. These indications of positive effects on socio-economic welfare have generated considerable enthusiasm for microfinance as an important tool for poverty reduction, something that every developing country should provide in a sustainable manner. However, poverty reduction is only possible if microfinance institutions have good financial and outreach performance.

Financial self-sustainability of microfinance institutions (MFIs) has been one of the issues attracting the attention of policymakers, as subsidies from international donors are unreliable especially in the presence of new advocacies. Commercialization of the microfinance industry has advanced in the last few years as an acceptable solution. Commercialization in this context means that MFIs adopt a business-like approach to the administration and operation of microfinance, use commercial sources of funds, and subject itself to prudential regulation and supervision (Brown, Guin, & Kirschenmann, 2012; Charitonenko, 2003). There is a growing realization that the provision of microfinance through market-driven, independent, and commercially oriented operations will have large-

scale outreach to its poor and female customers (Charitonenko, 2003; Hermes & Lensink, 2011; Robinsons, 2001).

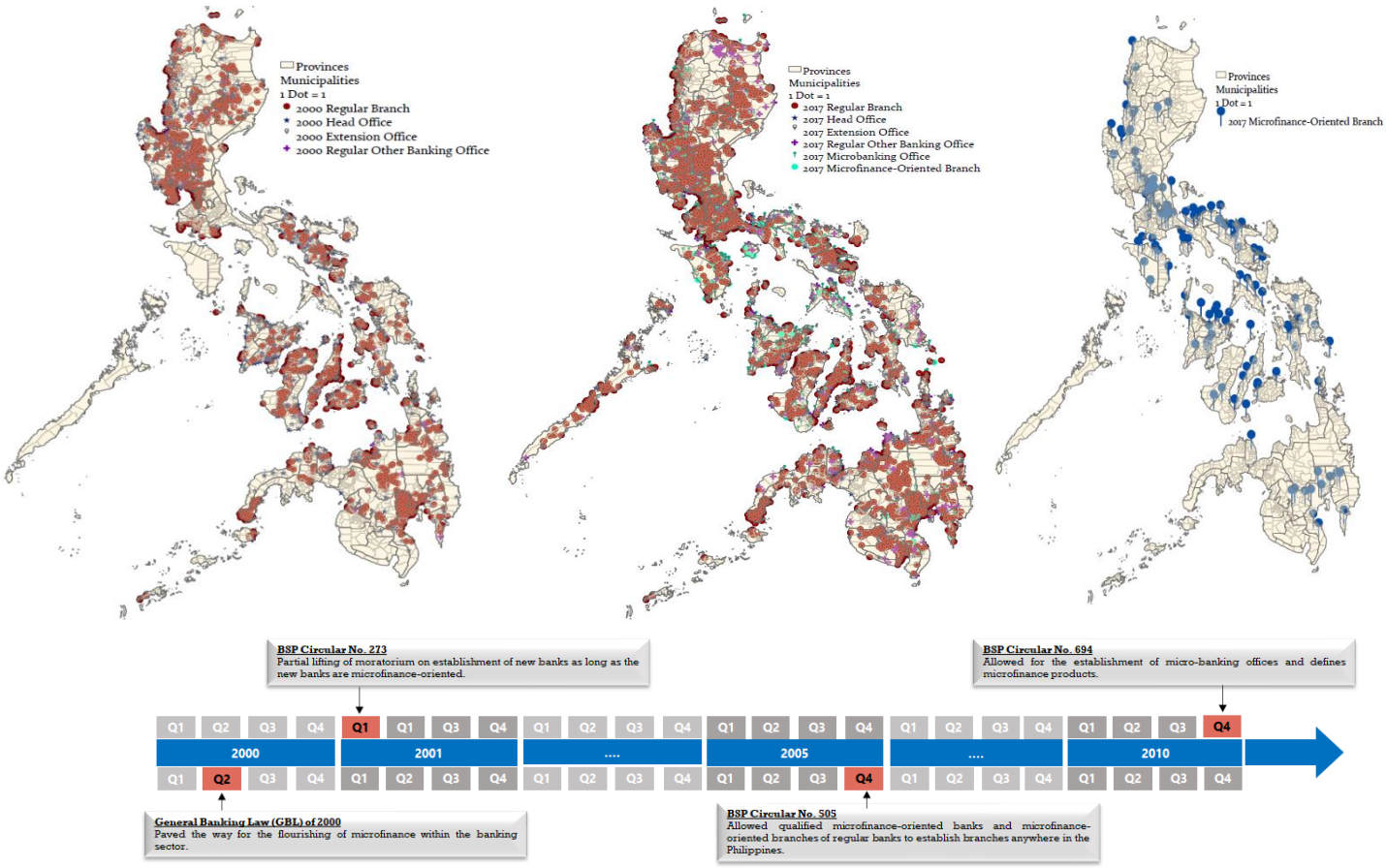
In the Philippines, prior to the adoption of the country's national strategy for microfinance, most banks did not consider microfinance as a potentially profitable market niche because of the high default risks and transaction costs associated with small scale lending to the low-income segment of the population (MCPI, 2011). The enactment of the General Banking Law in 2000 (Figure 1.4) set in motion both the institutionalization of microfinance as a banking activity, and the process of commercialization of microfinance services. Thereafter, the Bangko Sentral ng Pilipinas (BSP) issued Circular Nos. 273 and 505 (Figure 1.4) to provide enabling policy and a regulatory environment in which banks could efficiently deliver microfinance services in a viable and sustainable manner.

BSP Circular No. 273, dated 27 February 2001, partly lifted the moratorium on the establishment of new banks, allowing new banks that are microfinance oriented to locate in places not fully served by existing rural banks or microfinance-oriented banks (MOBs). On one hand, BSP Circular No. 505, dated 22 December 2005, allowed qualified MOBs and branches of regular banks to establish branches anywhere in the Philippines. Since then, MOBs have been established to provide financial services that cater primarily to the credit needs of the basic[2] and/or disadvantaged sectors for their microenterprises and small businesses. Figure 1.4 shows that microfinance-related policy refinements[3] further increased

[2] The Social Reform and Poverty Alleviation Act of 1997 (or Republic Act No. 8425) defined basic sectors as farmer-peasants; artisanal fisherfolk; workers in the formal and informal sectors; migrant workers; indigenous peoples and cultural communities; women; differently-abled persons; senior citizens; victims of calamities and disasters; youth and students; children; and urban poor.

[3] The BSP (n.d.) provides a detailed inventory of the major policies implemented for those seeking a complete list of bank-related regulations on microfinance and financial inclusion.

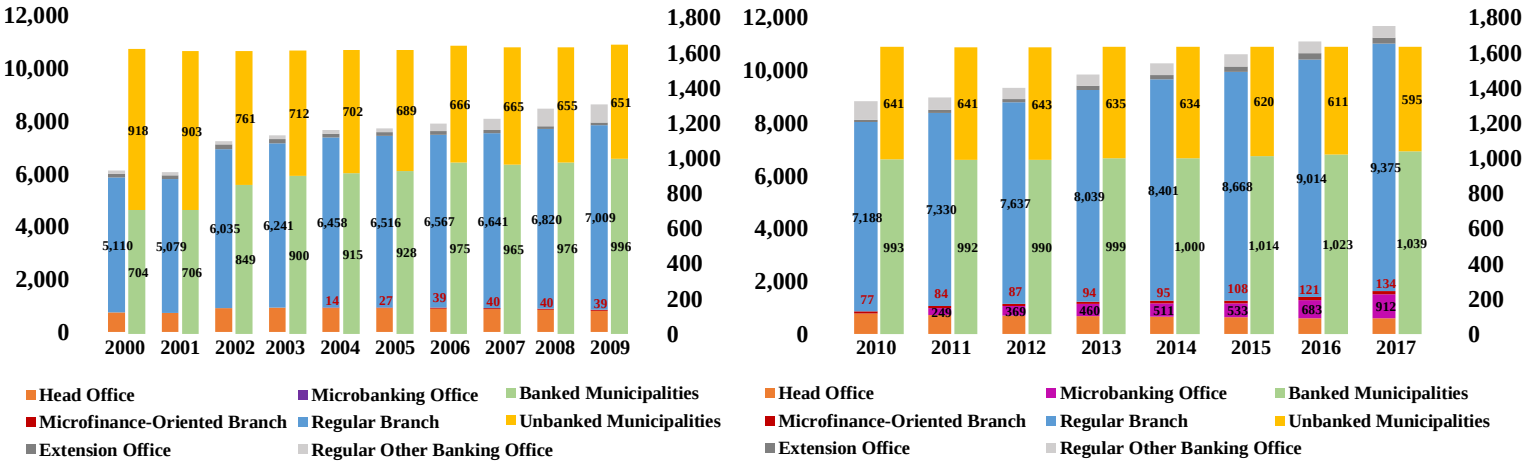
Figure 1.4: Geographical Distribution of Financial Access Points in the Philippines



Source of data: Bangko Sentral ng Pilipinas; data plotted by the Author.

Figure 1.5: Distribution of Bank Branches and Offices

(For the Period 2000 to 2017)



Source of data: Bangko Sentral ng Pilipinas

the number of bank branches and offices between 2000 (left-hand spatial map) and 2017 (middle and right-hand spatial map).

In 2004, banks started to establish MOBs (BSP, 2005). Figure 1.5 indicates that fourteen MOBs were established in 2004, and by 2017 the number had increased to 134.

However, several studies cast doubt on the effectiveness of microfinance in terms of improving household welfare (Attanasio et al., 2015; Banerjee et al., 2015; Banerjee, Duflo, Glennester, and Kinnan, 2015; Coleman, 2006; Hulme & Mosley, 1996; Islam, 2011). For instance, Karlan and Zinman (2011) in its conduct of randomized intervention at the individual level of male and female loan applicants in Manila, Philippines found that microcredit reduced the number of businesses and labor hired. Kondo, Dingcong, and Infantado (2008) find to the contrary; their data suggest that while the impact of microcredit on the poor is negative or insignificant, access to microfinance loans increased the number of enterprises and employed persons. The second analytical chapter examines this issue through an analysis of nationally representative household panel data.

1.2.1 Second analytical chapter: Objectives, contributions, and main findings

The second analytical chapter (Chapter 3) investigates the effect of access to microfinance through MOBs on household welfare, depending on the length of MOB presence in municipalities. I limit the scope of the study to accessibility of microfinance through MOB presence in lieu of the growing commercialization of the microfinance industry in the Philippines and because no panel dataset on actual household borrowing was available at the time of the study.

This study complements the scant literature assessing the sensitivity of benefits of microfinance with respect to the length of exposure. First, it examines the duration (i.e., *immediate, incremental, persistent,* and *total* (or *net*)) of the effect in terms of length of MOB presence (i.e., *short-* and *long-run*) in the municipality where the household is domiciled. Second, the effects on measures of household welfare, namely probability of and income from wage work and self-employment, and consumption expenditures (i.e., food, medical care, alcoholic beverages & tobacco, and education) are further differentiated in terms of poverty level and gender of the household head, since the findings of most empirical studies indicate that there are disproportional impacts on gender and economic class.

A difference-in-differences (DID) household fixed effects (FE) combined with inverse-probability-weighted (IPW) is used to determine whether MOB presence is welfare-improving. This method is employed so as to account for the endogeneity problem associated with self-selection, and for sample attrition, which are typical problems encountered when using observational panel data. The DID-FE addresses non-random selection based on observable attributes and time invariant unobservables while the IPW manages the bias incurred by possible non-random dropping of households from the survey. I also examine the sensitivity of the result to unobservables following Oster (2019) and Altonji, Elder, and Taber (2005).

The main findings of the second study are that households that have short-term access to microfinance through MOBs do not enjoy immediate gain, and in some instances the benefits or adverse effects persist even after MOBs cease operation. Second, increased non-food expenditures rather than income-generating self-employment activities, are observed

when the presence of MOBs is short-lived. Third, in the case of long-term MOB presence, households are more likely to engage in self-employment activities, and entrepreneurial income increases. However, these gains do not accrue indefinitely and may even diminish or regress in the long run. Fourth, poor households increase their medical care and education spending, and are more likely to be self-employed, when they have access to microfinance through MOBs. Finally, spending by female-headed households on non-food goods and services increases even when MOB presence is short-term.

1.3 Structure of the Dissertation

Chapter 2 to 4 are organized as follows. Chapter 2 examines in detail *substitutability* and *complementarity* among microfinance providers, moneylenders, relatives and friends, and other formal credit sources, and discusses the socioeconomic and demographic household characteristics associated with the likelihood of and amount of borrowing from each credit source. Chapter 3 evaluates whether access to microfinance through MOBs is welfare improving with respect to *length* of MOB presence in a municipality. Finally, Chapter 4 draws conclusions and presents implications of the findings.

Table 1.1: Selected 2017 Microfinance Sector Data

Type	No. of Reporting	No. of Active Borrowers	Average Loan Balance Per Borrower In Philippine Peso (US Dollars)	No. of Enterprises Financed
Microfinance NGOs*	42	4,009,510	187.64 (3.72)	688,566
Microfinance Banks*	58	1,145,286	1,411.13 (28.00)	8,283
Cooperatives*	21	-	-	-
Total		5,154,796	799.38 (15.86)	696,849
Cooperatives**	8,946§	8,698,000	-	-

Source of data: *World Bank Mix Market, **Cooperative Development Authority

Notes: §Multipurpose and credit cooperatives. However, there are only 21 cooperatives reported in the database of World Bank and 9 cooperatives in the list of members of the Microfinance Council of the Philippines. The peso-dollar exchange rate used is PHP 50.40 as posted in the BSP website.

Chapter 2

Substitutability or Complementarity Between Microfinance Providers and Informal Lenders

This study examines whether the substitutability (complementary) role of microfinance is correlated with decreased (increased) likelihood (extensive margin) and amount of credit (intensive margin) that households demand from informal lenders. Multivariate probit and seemingly unrelated regression models are applied using nationally representative data collected in the Philippines. The estimation results indicate that microfinancing is a substitute of informal lending from both moneylenders, and relatives and friends. Households with microfinance loans are also less likely to borrow from other formal financial institutions. However, results on the extensive margin of poor or female-headed households suggest that microfinancing neither substitutes nor complements household borrowing from moneylenders and relatives and friends. These results highlight the importance of developing a well-tailored microfinance scheme that facilitates sustainability and financial inclusion.

2.1 Introduction

Reducing both individuals' and families' vulnerability to poverty has long been a socioeconomic priority in most developing countries. The provision of universal access to financial services, known as "financial inclusion," is believed to reduce poverty (Cull, Demirgüç-Kunt, & Morduch, 2007; Duvenback & Mader, 2020). The most celebrated means of attaining financial inclusion is microfinance, which has been expanding since the 1990s in many developing countries (Cull & Morduch, 2017). Microfinance provides various financial services to the unbanked or those dependent on informal lending, which often entails exorbitantly high interest rates (Kono & Takahashi, 2010).

It has been deemed that microfinance providers may drive informal lenders out of credit markets, as they target the poor that the informal lenders serve, with more favorable contractual terms and lower interest rates (Armendáriz & Morduch, 2010; Morduch, 1999; Islam, Nguyen, & Smyth, 2016). However, informal lenders continue to thrive and remain a significant source of funds among the low-income and marginalized sector. This is puzzling, given that many developing countries aggressively provide cheaper credit through microfinance programs, and must be possible if microfinance cannot truly reach the poorest of the poor (Copestake, Bhalotra, & Johnson, 2001; Navajas et al., 2000). Some studies have even pointed out that the short loan maturity and rigid repayment schedule of microfinance contracts compel individuals to borrow from informal lenders in order to keep up with the repayment of their microfinance loans that entail tightly structured installments (Berg et. al., 2013; Coleman, 1999; Jain & Mansuri, 2003). This could cause microfinance lending to crowd-in, rather than crowd-out, informal lending. If this happens, microfinance penetration can pose an important challenge to policymakers and proponents of microfinance, as the resultant multiple borrowing may lead to over-indebtedness, especially if funds are not used for productive activities (Berg et al., 2013).

Several studies have examined the complementary or substitutive roles of microfinance and informal lending. However, the results have thus far been mixed and inconclusive (Berg et al., 2013; Coleman, 1999; Demont, 2016; Ghate, 1992; Islam et. al., 2016; Jain, 1999; Karlan & Zinman, 2011; Kono, 2012; Tarozzi, Desai, & Johnson, 2015). The mixed empirical results imply that the relationship between microfinance and informal lending may be context-specific, and a careful analysis is necessary to draw policy

implications relevant to each specific context. I revisit the issue in the Philippines, which is globally recognized[4] as having policy and regulatory environments conducive to sustainable microfinance (BSP, 2015). I use nationally representative cross-sectional data taken from the 2014 Philippine Consumer Finance Survey (CFS) conducted by the BSP and explore whether household borrowing from microfinance providers has *substitutive* or *complementary* effects on informal borrowing in the context of the Philippines.

My study deviates from the existing literature in two important ways. First, while most empirical studies focus on *substitutability* or *complementarity* in terms of their propensity, I examine the impact of microfinance on both the *likelihood* (extensive margin) of borrowing from informal sources and the *amount* (intensive margin) of funds borrowed. Second, unlike existing studies that have treated "informal lenders" collectively (Angelucci, Karlan, & Zinman, 2015; Berg et al., 2013; Demont, 2016; Islam et al., 2016; Kaboski & Townsend, 2005; Karlan & Zinman, 2011; Tarozzi et al., 2015), I differentiate such lenders into two categories: namely moneylenders and relatives and friends. This is crucial because the two groups have different attributes, which have a distinct influence on the presence and outreach of microfinance that may affect the roles they play in conjunction with or to the exclusion of each other. For instance, moneylenders offer excessively high interest rates, but relatives and friends generally impose no interest charge (i.e., either zero or low interest rates). Using the CFS data fits the purpose of my study because it provides important information regarding whom do households borrow from and how much.

[4] The Philippines ranked first in Asia and 3rd in the world according to the 2014 maiden survey of Economic Intelligence Unit (EIU) on global financial inclusion environment.

To identify the *substitutability* or *complementarity* among credit providers, I first distinguish the credit sources of households into three classifications, namely microfinance providers, informal lenders, and other formal lenders. With these classifications, I further decompose informal lenders into moneylenders and relatives and friends and categorize other formal lenders as government institutions[5], banks[6], and other lending institutions[7]. I then employ a multivariate probit model and seemingly unrelated regression (SUR). The multivariate probit model estimates the likelihood of household borrowing while the SUR assesses the extent of credit demand in terms of the actual amount. The *substitutability* or *complementary* roles of microfinance on other credit sources are identified by the presence or absence of correlations across alterative credit choices. To deepen insights from my study, I also identify the socioeconomic and demographic household characteristics associated with the *likelihood* and *amount* of borrowing from each credit source.

The estimation results indicate that household borrowing from microfinance providers are *substitutes* of informal loans from moneylenders, relatives and friends, and other formal financial institutions except government institutions. However, results on the extensive margin of poor or female-headed households suggest that lending of microfinance providers is not a substitute or complement for informal lending. Thus, in the context of this

[5] Government institutions comprise of Government Service Insurance System (GSIS), Republic of the Philippines Social Security System (SSS), Pag-Ibig, National Housing Authority (NHA), Urban Poor Affairs Office (UPAO), Retirement and Separation Benefits (RSBS), Comprehensive Agrarian Reform Program (CARP), Philippine Deposit Insurance Corporation (PDIC), Agrarian, Government City Treasure, Department of Social Welfare and Development (DSWD), Barangays, and Department of Trade and Industry (DTI).

[6] Banks also include cooperatives and savings & loan associations.

[7] Other lending institutions comprise of credit card companies, in-house financing, real estate developers, motor vehicle stores, appliance centers, among others.

study, the expansion of the microfinance industry does not necessarily translate into multiple borrowing that can trap households in a vicious cycle of debt; however, its overall effect on financial inclusion remains inconclusive.

My study contributes to the literature on the interaction of microfinance and informal credit markets in at least three respects. First, I extend the research on heterogeneity in the *substitutability* or *complementary* role of microfinance on informal credit markets by differentiating them into the influence on moneylenders and relatives and friends, not only for the discrete choice of whether to borrow but also for the continuous choice of how much to borrow. Few studies have examined the differentiated *substitutive* role of microfinance on the intensive and extensive margins of household borrowing from moneylenders and relatives and friends. Second, this study uses multivariate probit model and SUR to determine the presence of *substitutability* or *complementarity*, instead of multinomial models. The advantage of these models is that they deal with multiple correlated decisions that are not necessarily mutually exclusive. This provides a high degree of realism, because the decision to borrow from microfinance providers may be correlated with the presence of moneylenders, relatives and friends, and other formal lenders. Third, I consolidate the lending service features of some twenty-three microfinance providers to present the mechanisms that make them substitutes of moneylenders, relatives and friends, and other formal lenders in the case of the Philippines.

The rest of this chapter is organized as follows. Section 2.2 reviews the literature on microfinance and informal lending. Section 2.3 presents the study's data. Section 2.4 outlines the model specification. The results are reported in Section 2.5. Section 2.6 discusses

microfinance mechanisms that potentially *substitute* or *complement* informal lenders. Finally, Section 2.7 concludes the chapter.

2.2 Literature Review

Informal lenders such as relatives, friends, moneylenders, traders, and landlords are ubiquitous in most developing countries, which provide small uncollateralized loans that are flexible in terms of maturity (i.e., at least the length of an agricultural cycle). Their prevalence can be attributed to their close physical and social proximity to borrowers, which ensures timely access and speedy disbursement. This is especially true when credit is provided by relatives and friends who are easily accessible and mostly lend based on pure altruism (Lee & Persson, 2015). Other forms of informal lenders such as moneylenders are, however, often exploitative because they typically charge excessively high interest rates (Islam et al., 2016).

Microfinance providers are seen to displace the latter form of informal lenders, as they mimic the features of both informal and formal lending. Like informal lenders, microfinance providers lend to the poor either on an individual or a group basis, but differ in the sense that they lend at lower interest rates like traditional banks (Armendáriz & Morduch, 2010; Morduch, 1999; Islam et al., 2016). Despite these features, existing studies that have attempted to determine whether microfinance providers *substitute* or *complement* informal lenders and other formal lenders present mixed evidence depending on the data as well as the choice of methods employed.

For instance, the Asian Development Bank (2007) uses a DID approach for data from the Philippines and finds that microcredit[8] programs reduce the dependence of households on moneylenders and more expensive loans from banks and non-bank financial institutions. Berg et al. (2013) similarly employ the DID framework and argue that microfinance membership in Bangladesh reduced the propensity to borrow from moneylenders and the amount of informal borrowing. Using a related DID method, Banerjee, Duflo, Glennester, and Kinnan (2015) conducted a randomized evaluation of a group-lending microcredit program in Hyderabad, India and found a reduced incidence of household borrowing from informal sources, but not a reduction in loan amounts. Islam et al. (2016) arrived at the same results in Bangladesh but employed another approach: household fixed-effects regression combined with the propensity score matching method.

Berg et al. (2013) and Demont (2016) explain that households' propensity to borrow from moneylenders declines when microfinance providers "cream skim" low-risk borrowers in a monopolistically competitive credit market. This cream skimming by microfinance providers induces moneylenders to distribute their fixed costs due to the reduced volume of lending to higher-risk borrowers, which consequently raises nominal interest rates and discourages informal borrowing.

In contrast, several empirical studies that conducted an intention-to-treat analysis claimed that microfinance providers, informal lenders, and other formal financial institutions complement rather than substitute each other. For example, Karlan and Zinman (2011)

[8] This study does not differentiate between microfinance loans and microcredit or between microfinance providers and microfinance institutions.

conducted a randomized approval of uncollateralized microcredit loans with fixed repayment schedules for microentrepreneurs in the Philippines and found that microcredit raises financial assistance from friends or family during an emergency. In a clustered randomized trial in north-central Sonora Mexico, Angelucci et al. (2015) posit that the expansion of microfinance institutions like Compartamos Banco increased the likelihood of informal household borrowing, although the outcome for borrowing amounts had no statistically significant crowding in or out effects. Lastly, Tarozzi et al. (2015) show that the assignment of households in rural Amhara and Oromiya, Ethiopia to a microfinance program crowded in borrowing and female-initiated household loans from credit sources such as informal lenders, NGOs, banks, and cooperatives.

Other empirical studies also argue that the rigid payment schedule imposed by microfinance providers induces the crowding in of informal lending when borrowers seek funds to avoid loan default (Berg et al., 2013; Islam et al., 2016; Jain & Mansuri, 2003; Mallick, 2012; Meyer, 2002; Sinha & Matin, 1998). Kono (2012) theoretically and numerically shows that if the maturity of microcredit is shorter, the tendency of households to smoothen their consumption increases their loan uptake from moneylenders. Finally, Coleman (1999) explains that an increase in informal loans is probable when microfinance members conduct moneylending through "arbitrage" activities wherein they borrow from microfinance institutions at relatively low interest rates and lend the proceeds at a mark-up. This way, informal lenders complement microfinance institutions by reducing the cost of lending when informal lenders directly channel funds to poor borrowers that keeps microfinance loans from being diverted to unproductive activities (Madestam, 2014). Floro

and Yotopoulus (1991) write that in the Philippines, "formal lenders and upstream buyers do not lend directly to small borrowers instead they deal with relatively collateral-rich borrowers" (as cited in Madestam, 2014).

These together indicate that the relationship between microfinance and informal lending is not uniform and depends on the studied context. Based on the case of the Philippines, I complement these studies by expanding the scope of analysis to cover both intensive and extensive margins as well as to differentiate the informal lenders into two categories: moneylenders and relatives and friends.

2.3 The Data

The dataset is the 2014 CFS collected by the BSP. The CFS is a nationwide survey conducted every four years and contains rich information on households' financial condition, what they own (financial and non-financial assets), from whom they borrow (loan providers), and how much they borrow (level of indebtedness), among others. The 2014 CFS is the latest survey published from the time it started in 2009.

The 2014 CFS sample contains 15,503 households covering all regions in the country, except Leyte province (displaced due to typhoon Yolanda) and the Autonomous Region in Muslim Mindanao. The survey's domains are the National Capital Region (NCR) and Areas Outside NCR (AONCR). It uses a two-stage sampling with stratification at the primary sampling unit level. In the first stage, households were stratified in terms of enumeration areas (EAs) or *barangays*. Random samples of EAs were drawn in each region with probability proportional to EA size (i.e., total number of households). In the second sampling

stage, random samples of twelve (12) households for NCR and sixteen (16) for AONCR were selected from each of the sample EAs. The data were collected from early July 2014 to late January 2015.

2.3.1 Descriptive Statistics

Table 2.1 presents the descriptive statistics on household borrowing by lender type as well as socioeconomic and demographic characteristics between borrowing and non-borrowing households. Out of 15,503 households, 14,722 respondents (or 95.0 percent) are household heads. There are 3,298 (or 22.4 percent of the 14,722) households that borrowed money from at least one source. Among households with a loan, 30.0 percent borrowed from moneylenders, 16.0 percent borrowed from microfinance providers, and 10.0 percent borrowed from relatives and friends.[9] Additionally, 474 households (or 14.4 percent of the 3,298) borrowed from more than one credit source.

In terms of poverty level, poor households mostly choose to borrow from other lending institutions at 37.9 percent (or 69 poor households out of 182), from moneylenders at 26.4 percent (48 households), from banks at 14.8 percent (27 households), and from microfinance providers at 11.0 percent (20 households). There are 15 poor households that borrowed from both other lending institutions and informal lenders, three borrowed from both moneylenders and banks, and only one from both microfinance providers and moneylenders. As for female-headed households, it is noted that 31.3 percent prefer other

[9] The share of banks/cooperatives/savings and loans associations at 19.6 percent and other lending institutions at 31.6 percent are not identified as being sizeable; they are expected to show high percentages since they are comprised of several types of lenders.

lending institutions (or 216 households out of 690) as a credit source followed by moneylenders at 24.6 percent (170 households), banks at 13.8 percent (95 poor households), and microfinance providers at 13.6 percent (94 households). There are 27 female-headed households that borrowed from both other lending institutions and informal lenders, 14 borrowed from both moneylenders and formal lenders, 2 from both banks and relatives and friends, and 10 from both microfinance providers and informal lenders.

The largest loan amount, on average, were provided (in descending order) by banks at PHP 24,293.1 (USD544.5), other lending institutions at PHP 18,442.1 (USD413.3), and moneylenders at PHP 9,327.9 (USD209.1).[10] Most heads of borrowing households are male (79.1 percent), have an average age of roughly 49 years, at most completed secondary education, and are employed or self-employed. The average household size is five. The sample households' assets have a value of PHP 5,183 (USD116.2), and the households are domiciled in cities or first-class municipalities.[11]

Table 2.2 shows the characteristics of households that borrow from different credit sources. Microfinance providers cater distinctively to households with heads who have at most secondary education, own fewer financial assets, and are self-employed. Interestingly, the characteristics of the households who borrow from moneylenders and relatives and friends are similar to those households that borrow from microfinance providers, except that they are also employed household heads. Relatives and friends are more common credit

[10] The foreign exchange rate used throughout this study is the end-of-period 2014 average of PHP 44.62 for one US dollar, posted by the BSP in its website.

[11] This study follows the Philippine Standard Geographic Code (PSGC) classification of the municipalities that is based on the revenue earned by the municipality. Besides cities, first-class municipalities are the richest administrative division, with an average annual revenue of at least PHP 55 million or USD1.24 million.

sources for female-household heads. Table 2.2 also shows that household borrowing from other formal lenders is generally done by household heads who are older, employed, have at least secondary education, or have greater financial assets.

2.4 Model Specification

The literature often uses multinomial models like the multinomial logit model to estimate the *likelihood* of household borrowing among microfinance providers, informal lenders, and other formal lenders (e.g., Barslund & Tarp, 2008; Ding & Abdulai, 2020; Mpuga, 2010). However, multinomial models assume IIA, which could be too restrictive, as outcomes can depend directly on each other after conditioning on regressors. Even if the multivariate probit model relaxes the IIA assumption, only a single decision based on two or more alternatives can be examined. The multivariate probit can overcome these shortcomings as it addresses the decisions to borrow from multiple sources simultaneously, which can be correlated with each other. It recognizes the correlation in the error terms across household borrowing from different lenders but not across household borrowers within a given lender. That is, $E[\varepsilon_{ij}\varepsilon_{im}] = \rho_{jm}\ \forall$ for lender $j \neq m$ for a household i but $E[\varepsilon_{ij}\varepsilon_{fj}] = 0\ \forall$ for households $i \neq f$.

I adopt the discrete choice process of Greene (2018). He posits that the outcome of a discrete choice, which in our study is the decision to borrow from a specific lender, is based on the marginal benefit or cost of choosing a specific lender and by not choosing (and borrowing from an alternative lender).

The net benefit (or net utility) of choosing credit source j by household i can be modeled as multivariate probit with an unobserved (or latent) variable y_{ij}^* such that (Capellari & Jenkins, 2003; Greene, 2018)

$$y_{ij}^* = \beta_j X_i' + \varepsilon_{ij}, \;\; j = 1, \dots, K \tag{1}$$

The observed variable y_{ij} is related to the latent variable y_{ij}^* through the observation rule:

$$y_{ij} \begin{cases} 1 \; if \; y_{ij}^* > 0 \\ 0 \; if \; y_{ij}^* \leq 0 \end{cases} \tag{1a}$$

where y_{ij} is the observed binary outcome; a value of 1 indicates that household i borrowed from credit source j and 0 indicates otherwise. y_{ij}^* is an underlying unobservable (or latent) borrowing of household i from K different credit sources, and ε_{ij} is the error term. X_i' is a vector of socioeconomic and demographic characteristics of household i. It also represents locational dummies to control for broad structural differences in economic development or risk levels in the city or municipality where the household is residing.

The socioeconomic and demographic household characteristics used in this study are similar to those utilized in existing literature (e.g., Barslund & Tarp, 2008; Ding & Abdulai, 2020; Menkhoff & Rungruxsirivorn, 2011; Pal, 2002; Pham & Lensink, 2007). These comprise of gender, age, educational attainment, and employment status of the household head as well as family size and financial household characteristics like house and/or land and financial assets ownership.

Meanwhile, household credit sources are classified into: (1) microfinance providers (i.e., commercial banks, savings/thrift banks, rural/cooperative banks, cooperative,

microfinance NGOs and NGOs), (2) moneylenders, (3) relatives and friends, (4) banks/cooperatives/savings and loan associations, (5) government institutions, and (6) other lending institutions. Moneylenders and relatives and friends are referred to as "informal lenders," while banks/cooperatives/savings and loan associations, government institutions, and other lending institutions are classified as "other formal lenders."

Given the latent-variable models (1) and (1a), we have the probability that household i borrowed from credit source j as:

$$\begin{aligned} \Pr(y_{ij} = 1) &= \Pr(\beta_j' X_i + \varepsilon_{ij} > 0) \\ &= \Pr(-\varepsilon_{ij} < \beta_j' X_i) \\ &= F(\beta_j' X_i) \end{aligned} \tag{1b}$$

where $F(\cdot)$ is the cumulative distribution function of $-\varepsilon_{ij}$. The error terms are assumed to be distributed as multivariate normal with zero conditional mean and variance normalized to unity (for identification of the parameters), where $(u_{MP}, u_{ML}, u_{RF}, u_B, u_G, u_{OLI})$[12]. Multivariate normal $(0, \Omega)$ and the symmetric variance-covariance matrix Ω is given by:

$$\Omega = \begin{bmatrix} 1 & \rho_{MP,ML} & \rho_{MP,RF} & \rho_{MP,B} & \rho_{MP,G} & \rho_{MP,OLI} \\ \rho_{ML,MP} & 1 & \rho_{ML,RF} & \rho_{ML,B} & \rho_{ML,G} & \rho_{ML,OLI} \\ \rho_{RF,MP} & \rho_{RF,ML} & 1 & \rho_{RF,B} & \rho_{RF,G} & \rho_{RF,OLI} \\ \rho_{B,MP} & \rho_{B,ML} & \rho_{B,RF} & 1 & \rho_{B,G} & \rho_{B,OLI} \\ \rho_{G,MP} & \rho_{G,ML} & \rho_{G,RF} & \rho_{G,B} & 1 & \rho_{G,OLI} \\ \rho_{OLI,MP} & \rho_{OLI,ML} & \rho_{OLI,RF} & \rho_{OLI,B} & \rho_{OLI,G} & 1 \end{bmatrix} \pm \tag{2}$$

Of particular interest are the off-diagonal elements in Ω, which represent the unobserved correlation between the stochastic components of the different types of credit sources. This

[12] MP refers to microfinance providers, ML is moneylender, RF is relative and friends, B is banks/cooperatives/savings & loan associations, G is government institutions, and OLI is other lending institutions.

assumption means that Equation (2) generates a multivariate probit model that jointly represents decision to choose a particular lender. This specification with non-zero off diagonal elements allows for correlation across error terms of several latent equations, which represents unobserved characteristics that affect the choice of lender. As such, the correlation between household borrowing from six different credit sources occurs when unobservable characteristics captured in the error terms influence household choice of lender (Yahaya, Zereyesus, Nakelse, & Haruna, 2019). Yahaya et al. (2019) explain that a negative and significant correlations among the error terms have been interpreted as the existence of substitutability between household borrowing from credit sources, and positive and significant correlations show complementarity between household borrowing from credit sources (Yahaya et al., 2019, p. 607). Asfaw, Battista and Liper (2016) write that "multivariate probit allows the unobserved and unmeasured factors (error terms) to be freely correlated wherein the source of correlation may be due to substitutability (negative correlation) or complementarity (positive correlation) between credit sources" (Asfaw et al., 2016, p. 645; Kassie, Teklewold, Jaleta, Marenya, and Erenstein, 2015, p. 402).

While the multivariate probit provides potentially valuable information on the probability of an event (i.e., how likely it is), it cannot reveal the extent of credit demand. I develop a SUR model to estimate the *substitutability* or *complementarity* in terms of the actual amount of credit demanded by households from the six credit sources.

The model consists of K linear regression equations for N households. The jth equation for household i is:

$$y_{ij} = \alpha_j X_i' + u_{ij}, i = 1, \dots, N \; and \; j = 1, \dots, K \qquad (3)$$

where y_{ij} is the inverse hyperbolic sine (or arcsinh) transformation[13] of the borrowing amount of a household, i indexes borrowers, j indexes lenders, X_i' is a vector similar to those identified in Equation (1), and the errors u_{ij}. Each equation contains the same set of independent variables.

Loans acquired by households are treated separately, as it is observed that households have multiple borrowings with different purposes from several credit sources. Thus, multiple loans contracted from different credit sources by one household are treated as separate transactions.

Lastly, I also examined the heterogenous substitutability or complementary role of microfinance providers with informal lenders and other formal lenders depending on the poverty level of the household and the gender of household head. In terms of poverty level, I distinguish between poor and non-poor, where a household is considered poor if it lives below PHP 10,727 (USD241.63).[14] Households who are poor are uncapable of replacing informal borrowing with microfinance because they do not have acceptable collateral or funds to meet microfinance repayment schedules (Islam et al., 2016). As for gender differences, Islam et al. (2016) explain that women who are given access to microfinance

[13] The inverse hyperbolic sine transformation can be expressed as $arcsinh(x) = \log\left(\sqrt{X^2 + 1} + x\right)$. Bellemaret and Wichman (2020) explain that applied econometricians frequently transform a variable to an arcsinh because it "approximates the natural logarithm of a variable and allows retaining zero-valued observations".

[14] The Philippine Statistics Authority (PSA), in its 06 December 2019 press release entitled "Proportion of Poor Filipinos was Estimated at 16.6 Percent in 2018", reported that the poverty threshold (on average) for a family of five per month in 2018 is PHP 10,727 (Source: https://psa.gov.ph/poverty-press-releases/nid/144752).

products and services increase their needs and ability to borrow from informal sources because they will be seen as good credit risk.

2.5 Estimation Results

I first discuss the factors affecting credit choices and then move on to the correlations of the error terms that identify the *substitutability* or *complementary* role of microfinance. The sample is limited to households with a loan from at least one lender. Non-borrowing households are excluded because, since credit demand is zero at the outset, there is neither *substitutability* nor *complementarity*.

2.5.1 Likelihood of Household Borrowing from a Lender

Table 2.3 presents the socioeconomic and demographic household characteristics that influence the likelihood of borrowing from various credit sources and where the estimated coefficients are the average marginal effects.

2.5.1.1 Microfinance Providers

Households with more members are associated with 2.4 percent increase in the likelihood of households borrowing from microfinance providers since large families are more likely to have a higher dependency ratio. In some communities, the concept of family extends well beyond spouses and children, and can even include neighbors (World Bank, 2013). Households in the Philippines commonly live in one housing unit with siblings, grandparents, cousins, distant relatives, and even individuals who are unrelated and share

financial resources to meet daily needs or respond to emergencies, which increases the need for cash at hand.[15]

Collateral-rich households (with ownership of the house and/or land) appear to be associated with 23.2 percent reduced likelihood of borrowing from microfinance providers. This validates microfinance institutions' policy of giving the poor access to financial services by not requiring tangible assets as a guarantee of loan payment (Agbola, Acupan, & Mahmood, 2017; De Janvry & Sadoulet, 2016; Duvendack & Mader, 2020; Mpuga, 2010; Pham & Lensink, 2007).

The results in Table 2.3 also indicate that household heads that are self-employed are associated with a 17.6 percent increase in borrowing from microfinance providers relative to the base employment status of "others" (e.g., retired, student, overseas worker, employed but on leave [such as on sabbatical], laborer, gardener, and farmer). This is hardly surprising since the thrust of microfinance programs is to serve clients with entrepreneurial ambitions (Armendáriz & Morduch, 2010; De Janvry & Sadoulet, 2016; Morduch, 1999).

2.5.1.2 Informal Lenders

When it comes to the factors associated with borrowing from informal lenders, young household heads are correlated with 0.4 percent increase in the likelihood of borrowing from moneylenders, presumably because the net wealth of people in the early stages of their working life is low and their collateral is inadequate for guaranteeing a loan (Pham & Lensink,

[15] In the dataset, family members are categorized as follows: spouse, son/daughter, son-in-law/daughter-in-law, grandchild, father/mother, grandparent, other relatives, and no relation.

2007). In line with these results, financial asset-rich households are less likely to borrow from both moneylenders (by 4.9 percent) and relatives and friends (by 4.0 percent), while collateral-rich households are correlated with 13.6 percent less likely to borrow from moneylenders.

Meanwhile, household heads with a primary (by 41.2 percent) or secondary (by 31.4 percent) education at most are more likely to borrow from moneylenders, while those with a secondary (42.8 percent) or tertiary (63.0 percent) education at least are less likely to borrow from relatives and friends. This reflects the fact that those lacking university educations are not literate enough to make wise financial decisions or choose the financial products offered by formal institutions that best suit their needs.

Remarkably, large family size has a negative relationship of 3.9 percent with the likelihood of borrowing from relatives and friends. There are two possible explanations for this result. First, Lee and Persson (2015) explain that households are hesitant to commit family funds for lending because it will reduce familial transfers during days of low consumption, emergencies, or crisis. Second, while family financing is cheap (with usually zero interest), it can carry shadow costs and create family rifts upon loan default, which are persistent and "never really go away". It effectively lacks limited liability, which discourages its use.

Lastly, households with heads that are self-employed, similar to microfinance providers, are correlated with 9.6 percent increase in the likelihood to obtain credit from moneylenders.

2.5.1.3 Other Formal Lenders

The likelihood of borrowing from banks and government institutions generally increases for households with older heads. In terms of educational attainment, household heads with at least some tertiary education are associated with 59.8 percent increase in the likelihood of borrowing from banks. This is in contrast to informal lending, which targets the less educated. Collateral-rich households tend to borrow from government institutions by 33.1 percent and other lending institutions by 23.3 percent while financial asset-rich households are more likely to borrow from banks/cooperatives/savings & loan associations by 6.4 percent. As expected, employed household heads obtain credit from other lending institutions; surprisingly, however, not only unemployed and homemaker household heads but also self-employed heads are less likely to borrow from other lending institutions than are those in the baseline "other" category. Self-employed household heads are also less likely to borrow by 35.6 percent from government institutions.

2.5.2 Extent of Credit Demanded from Lender

Table 2.4 shows the estimation results of the SUR model. The signs of the coefficients presented in the table are qualitatively similar to the results of the multivariate probit model. Nonetheless, there are some dissimilarities, which underscore the importance of evaluating not only the likelihood of borrowing from a lender (extensive margin) but also the amount borrowed (intensive margin).

For example, the positive relationship between age of the head and microfinance borrowing turns out to be statistically significant. Microfinance providers would prefer to

grant larger loans to older adults, who are generally less risky since they have more stable income streams and higher net wealth. Moreover, the demand for loans and willingness to accumulate assets may increase with age, raising the amount of lending.

The negative relationship between age and house and/or lot ownership and the amount of borrowing from moneylenders becomes statistically insignificant. This indicates that moneylenders do not discriminate based on age or amount of financial assets owned when determining how much should be lent. Ghate (1992) and Kondo (2003) find that moneylenders do not require collateral from their borrowers. The borrower's credibility is hinged on the profitability of the borrower's business, loan repayment history, and trust. A statistically significant positive correlation is also noted between the amount of loan borrowed from relatives and friends and household heads that are unemployed and homemakers. Chen and Chivakul (2008) contend that housewives prefer financial support from relatives and friends.

On the other hand, the negative correlation between age and amount of household borrowing from other lending institutions as well as the positive correlation between household heads that obtain at least tertiary education and government and other lending institutions become statistically significant. The strong positive relationship between household size and amount borrowed from other lending institutions as well as the weak negative correlation between banks and employed household heads relative to "other" types of employment are another household attributes that become statistically significant but are insignificant in a binary choice via the multivariate probit model. Lastly, the negative

relationship between homemakers and amount of household borrowing from other lending institutions are now statistically insignificant.

2.5.3 Substitutability or Complementarity of Household Borrowing from Lenders

Tables 2.5 to 2.10 report the correlation of the error terms among the six credit sources in the multivariate probit and SUR models, respectively. A negative coefficient suggests *substitutability* between two types of lenders, meaning that choosing one of the lenders is associated with reduced reliance on credit from the alternative lender. It also signifies that lenders compete for the same household. By contrast, a positive correlation coefficient suggests *complementarity* between two lenders.

2.5.3.1 Multivariate Probit Model

Table 2.5 presents the relationship between microfinance and other financial sources. We find *substitutability* among moneylenders and relatives and friends. This result is consistent with other empirical findings (Berg et al., 2013; Islam et al., 2016). It reflects the fact that microfinance providers mimic some, if not all, of the features of informal lending such as personalized loan transactions, which makes them a viable competitor (Berg et al., 2013). However, we also find that microfinance can be a *substitute* of other financial sources. Only government institutions exhibit a statistically insignificant relationship, presumably because government institutions are important sources of external funding for the microfinance sector (MCPI, 2011).

The results also indicate that informal sources such as moneylenders and relatives and friends are *substitute* for formal sources such as banks and other lending institutions. Moneylenders similarly reduce households' reliance on government institution loans.

On the other hand, formal lenders such as banks and government institutions show *substitutability* among other lending institutions because they compete for the same type of borrowers.

Interestingly, if we examine households with different poverty level, microfinance providers neither substitute nor complement household borrowing from moneylenders, relatives and friends, or other formal lenders except for other lending institutions where a complementary relationship is observed (Table 2.6). This imply that the poor, being more vulnerable and due to lack of collateral, could not cross-finance microfinance loans with high-interest rate informal lenders and other formal lenders. On one hand, borrowing from microfinance providers by female-headed household, like poor households, is also associated with neither increased or reduced propensity to borrow from moneylenders, relatives and friends, or other formal lenders (Table 2.7). Nevertheless, among female-headed households, microfinance providers can be substitute of other lending institutions. Women also cannot afford cross-financing of microfinance loans possibly because, besides the lack of suitable collateral, they are perceived to have a high default risk as they are still confined to unprofitable businesses or occupations such as livestock rearing or crop harvesting even after access to microfinance (Islam et al., 2016; Milgram, 2005).

2.5.3.2 Seemingly Unrelated Regression (SUR)

Table 2.8 to 2.10 report the correlation of the error terms in the equations on the amount of household borrowing among six credit sources. Both joint and pairwise significance tests indicate *substitutability* of microfinance providers on the other five credit sources regardless of the poverty level of the household and gender of the household head.

A pairwise significance test examines the correlation of the residuals between two credit sources, while a joint significance test evaluates the correlation across six credit sources if it is zero. It is important to conduct both tests because the results may be significant between two credit sources but insignificant when those sources are tested together with others. In such a case, inferring *substitutability* among credit sources may be inaccurate.

As for the other credit sources, the results of the SUR echo those in the multivariate probit, except that the negative correlation between relatives and friends and government institutions becomes statistically significant.

2.6 Microfinance mechanisms for substituting informal lenders

Why are microfinance providers substitute of informal lenders? Tables 2.11 to 2.13 are presented to address this question. They show matrices of actual requirements for loan grants, interest, and other charges in the lending operations of some twenty-three microfinance providers[16] in the Philippines. The matrices corroborate the results in Tables 2.5 and 2.8 to 2.10, showing the *substitutability* among microfinance providers, moneylenders, and relatives and friends. Microfinance providers cater to the clients (female,

[16] This refers to NGOs, rural banks, and credit union/cooperatives.

young, or microentrepreneurial) of informal lenders and offer personal loans that are collateral-free, have low interest rates, and are flexible in terms of purpose, amount, and repayment schedule.

2.6.1 Informal Lenders' Financing Practices

Moneylenders in the Philippines are commonly called "5-6" lenders. Kondo (2003) finds in her survey conducted in a Philippine town that most 5-6 lenders prefer women clients, small vendors (e.g., ambulant,[17] rolling store,[18] multiple stall[19]), and service providers (e.g., owners of groceries, eateries, tailor shops, and hair salons) with busier stores. Small vendors have generally completed primary education at most. The business practices of moneylenders do not require collateral or documents from their borrowers, and no legal loan contracts are signed.[20] Kondo (2003) further explains that creditworthiness is assessed based on the profitability of the borrower's business and loan repayment history. The nominal interest rate charged is 20 percent over an agreed period. In the 2014 CFS, it is noted that households who borrow from moneylenders are given at most 3 years to pay their loan with payments done either daily, weekly, or monthly at an annual interest rate of zero, 10.0, or 20.0 percent.

On the other hand, relatives and friends usually lend money for as low as zero interest rate, without a formal agreement, and repayment have no particular schedule (i.e., only when

[17] Those unable to buy or rent a stall sell their goods along the sidewalks, in front of the larger stalls, or near the fish and meat vendors.
[18] This vendor does not rent a stall since he or she sells food, dresses, shoes, or household utensils and equipment in customized vehicles.
[19] This vendor pays for a stall annually.
[20] While no legal contracts are executed, moneylenders ask borrowers to sign in their logbooks in the form of notebooks, calendars, or even on a piece of paper.

they have extra money to pay their debt). Interestingly, the 2014 CFS also suggest that the proportion of households whose payments are behind schedule is larger than those who paid on time. The loan term is at most 6 years. And like moneylenders, the type of credit demanded from relatives and friends are personal, business, salary, emergency, multi-purpose, and non-cash loans (e.g., goods and fetilizers). Financing via relatives and friends is convenient because it is based on "social collateral," easily accessible, and fast. People in a barangay[21] usually know each other well and might think of 'everyone' as friends and relatives. But loans from relatives and friends are not necessarily more favorable than loans from moneylenders, microfinance providers, and other formal lenders. In fact, in the 2014 CFS some relatives and friends ask for 5.0 to 10.0 percent annual interest on loans. Moreover, some households are reluctant to choose such lenders because the relationship may be severed or damaged if the borrower defaults (Pru Life U.K., 2018). The potential for abuse is also a concern because they know that the borrower is in dire need of funds and may take the opportunity to earn more through interest rates that are even higher than what a formal lending institution would charge.

2.6.2 Microfinance Providers' Lending Standards

Microfinance providers, like informal lenders, cater to women, young adults, and microentrepreneurs. In fact, some loan products are designed specifically for women, such as those used to pay for tuition or school fees, personal and emergency needs, and

[21] The Philippines has four levels of administrative divisions – regions, provinces, cities and municipalities, and barangays – the highest level is regions and lowest is barangays.

mortgage/housing. Clients as young as 18 are eligible for microcredit. The purpose of microfinance loans is to finance microentrepreneurs' start-ups or obtaining additional capital (e.g., vendors or sari-sari store owners). Moreover, microfinance providers offer loan products that can be used for consumption purposes (e.g., installation of water and electric supply, payment of education-related expenses, health needs, burial assistance).

Uncollateralized flexible loan terms and repayment frequency are other features of microfinance loans that are similar to those offered by moneylenders. Loan maturity can be 64 months with a daily, weekly, monthly, or quarterly repayment frequency.

Furthermore, microfinance providers tender small loan amounts for as low as PHP 300 (USD6.7). They charge lower interest rates than moneylenders do. The monthly interest rates offered by microfinance providers are fixed and vary between zero and 5.0 percent. This is lower than the rates imposed by moneylenders of 10.0 to 20.0 percent and at par with the relatives and friends of 0.0 to 13.0 percent and bank rates of 1.0 to 3.0 percent.[22] They also offer limited liability which financing via relatives and friends lacks.

2.7 Conclusion

This study uses a nationally representative cross-sectional dataset drawn from the 2014 Consumer Finance Survey in the Philippines to determine if microfinance lending is associated with increased or decreased likelihood and amount of credit demanded by households from moneylenders, relatives and friends, and other credit sources. I employ a

[22] The interest rates of moneylenders and banks are extracted from the dataset.

multivariate probit model to estimate the likelihood of household borrowing and a seemingly unrelated regression model to assess the extent of credit demand in terms of actual amount.

Results from the multivariate probit model indicate that microfinance providers are *substitute* of moneylenders, relatives and friends, and other credit sources, except government institutions. They cater to clients of moneylenders and relatives and friends namely the collateral-poor or self-employed heads. However, among poor or female-headed households, microfinance providers neither substitute nor complement household borrowing from moneylenders and relatives and friends. As for the extent of credit demanded, the seemingly unrelated regression model suggests that lending of microfinance providers is correlated with reduced amount of household borrowing from moneylenders, relatives and friends, and other formal lenders regardless of the poverty level of the household and gender of the head.

Overall, these findings underscore the role of microfinance providers not only in the provision of access to cheaper credit to the financially underserved and unserved but also in reducing the reliance of households from informal borrowing. While the study draws robust findings of *substitutability* between microcredit and informal lenders, it could not determine if it is welfare-improving and whether the benefits vary with the length of households' access to microfinance.

For example, microfinance lending can have unintended consequences such as when the loans are not large enough that some households will have to reduce certain types of consumption (e.g., education) in the short term to cover borrowing costs and sustain their small businesses that they believe will increase their income and consumption in the long run.

But these benefits are likely to materialize only if the household have long-term access to microcredit. Typically, a sizeable amount of money is required for a business to grow and it takes several years more for it to be profitable.

Chapter 3 shall re-examine these concerns on whether microfinance borrowing is welfare-improving in the sense that it translates into increased microenterprise activities, employment, human capital investment (i.e., education and health), food consumption, and income. And if improvements in household welfare is sensitive to the length of exposure to microfinance.

Table 2.1: Descriptive Statistics of the Variables

Variable	Definition	Borrower		Difference (Borrower vs. Non-Borrower)	
		Mean	Standard Deviation	Mean	Standard Deviation
Dependent Variable					
Borrowed from					
Microfinance Providers[a]	= 1 if household head borrowed from institutions providing microfinance loans = 0 otherwise	0.160	0.367		
Moneylenders	= 1 if household head borrowed from moneylender = 0 otherwise	0.300	0.458		
Relatives & Friends	= 1 if household head borrowed from relatives & friends = 0 otherwise	0.100	0.300		
Banks/Cooperatives/Savings & Loan Associations	= 1 if household head borrowed from banks/cooperatives/savings & loan associations = 0 otherwise	0.196	0.397		
Government Institutions[b]	= 1 if household head borrowed from government institutions = 0 otherwise	0.064	0.245		
Other Lending Institutions[c]	= 1 if household head borrowed from other lending institutions = 0 otherwise	0.316	0.465		
Outstanding loan from	in Philippine Peso (US dollar equivalent)				
Microfinance Providers		2,508.542 ($56.224)	10,552.660		
Moneylenders		9,327.872 ($209.065)	66,271.170		
Relatives & Friends		2,627.735 ($58.895)	23,417.660		
Banks/Cooperatives/Savings & Loan Associations		24,293.07 ($544.480)	174,627.500		
Government Institutions		5,184.716 ($116.205)	45,777.710		
Other lending Institutions		18,442.07 ($413.342)	93,301.680		

(Continued)

Table 2.1: Continued

Variable	Definition	Borrower		Difference (Borrower vs. Non-Borrower)	
		Mean	Standard Deviation	Mean	Standard Deviation
Demographic Characteristics					
Gender of the household head	Male = 0 and Female = 1	0.209	0.407	-0.021**	0.008
Age of the household head	in years	49.278	11.695	-1.725***	0.266
Education of the household head					
Primary education	= 1 if household head's highest educational attainment is some elementary level, or elementary graduate = 0 otherwise	0.318	0.466	-0.068***	0.010
Secondary education	= 1 if household head's highest educational attainment is either some high school, or high school graduate, or vocational/technical = 0 otherwise	0.449	0.497	0.039***	0.010
Tertiary education	= 1 if household head's highest educational attainment is either some college, or college graduate, or some post-graduate, or post-graduate = 0 otherwise	0.216	0.412	0.045***	0.008
Others	= 1 if household head's highest educational attainment is either pre-school or responded 'Don't Know' in the survey question = 0 otherwise	0.016	0.127	-0.016***	0.003
Owns house and/or lot	= 1 if household owns the house/unit and/or lot = 0 otherwise	0.789	0.409	0.031***	0.008
Household size	Number of residents in the housing unit	5.301	2.339	0.588***	0.045
Amount of financial assets owned[d]	in Philippine Peso (US Dollar equivalent)	5,183.039 ($116.167)	50,093.010	1,835.418 ($41.137)*	987.322
Economic factors					
Employment status					
Employed	= 1 if household head is employed or worked for private household/private establishment/industries/government = 0 otherwise	0.375	0.484	0.049***	0.009

(Continued)

Table 2.1: Continued

Variable	Definition	Borrower		Difference (Borrower vs. Non-Borrower)	
		Mean	Standard Deviation	Mean	Standard Deviation
Unemployed	= 1 if household head is either unemployed, or permanently disabled and unable to work, or unemployed and looking for work = 0 otherwise	0.099	0.299	-0.050***	0.007
Self-employed	= 1 if household head is self-employed (i.e., services, trade, production, including unpaid work in a family business), or employer of a business = 0 otherwise	0.367	0.482	0.018*	0.009
Homemaker	= 1 if household head is homemaker = 0 otherwise	0.055	0.228	-0.012**	0.005
Others[e]	= 1 if household head has other type of employment = 0 otherwise	0.039	0.194	0.001	0.004
Geographic Factors					
Class of Municipality[f]					
Cities	= 1 if household is situated in a city = 0 otherwise	0.258	0.438	0.006	0.009
1st class municipality	= 1 if household is situated in a 1st class municipality = 0 otherwise	0.282	0.450	-0.020**	0.009
2nd class municipality	= 1 if household is situated in a 2nd class municipality = 0 otherwise	0.111	0.314	0.006	0.006
3rd class municipality	= 1 if household is situated in a 3rd class municipality = 0 otherwise	0.136	0.342	0.002	0.007
4th class municipality	= 1 if household is situated in a 4th class municipality = 0 otherwise	0.143	0.350	0.010	0.007

(Continued)

Table 2.1: Continued

Variable	Definition	Borrower		Difference (Borrower vs. Non-Borrower)	
		Mean	Standard Deviation	Mean	Standard Deviation
5th and 6th class municipality	= 1 if household is situated in a 5th and 6th class municipality = 0 otherwise	0.070	0.256	0.005	0.005

Notes: Estimated using the 2014 Consumer Finance Survey. The average Philippine Peso per US Dollar used was at PHP 44.62 (source of data: Bangko Sentral ng Pilipinas).
***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

a Comprised of commercial banks, savings/thrift banks, rural/cooperative banks, cooperative, microfinance NGOs, and NGOs.

b Comprised of GSIS, SSS, Pag-Ibig, NHA, UPAO, RSBS, CARP, PDIC, Agrarian, Government City Treasure, DSWD, Barangays, and DTI.

c Includes credit card companies, in-house financing, real estate developers, motor vehicle stores, appliance centers, among others.

d Comprised of savings deposit, time deposit, stocks/shares of stocks, mutual funds/Unit Investment Trust Fund, treasury bills/bonds, corporate bonds, paluwagan, piggy bank, cooperative, senior citizen's fund, lending savings, Armed Forces & Police Savings & Loan Association Inc., share fund in the school, CARD Bank, cashbond, butao, microfinance, Tagum Cooperative, and ASA Philippines.

e Includes retired, student, overseas filipino workers (OFW), employed but on leave including sabbatical, laborer, gardener, and farmer.

f Philippine Standard Geographic Code (PSGC) published by the PSA on December 2019 defined that 'municipalities in the Philippines are divided into six (6) main classes according to the average annual income that they actually realized during the last four calendar years immediately preceding the general classification: (1) 1st class Municipalities that have obtained an average annual income of PHP 55 million (USD 1.24 million) or more; (2) 2nd class Municipalities that have obtained an average annual income of PHP 45 million (USD 1.01 million) or more but less than PHP 55 million (USD 1.24 million); (3) 3rd class Municipalities that have obtained an average annual income of PHP 35 million (USD 0.79 million) or more but less than PHP 45 million (USD 1.01 million); (4) 4th class Municipalities that have obtained an average annual income of PHP 25 million (USD 0.56 million) or more but less than PHP 35 million (USD 0.79 million); (5) 5th class Municipalities that have obtained an average annual income of PHP 15 million (USD 0.34 million) or more but less than PHP 25 million (USD 0.56 million); and 6th class Municipalities that have obtained an average annual income of less than PHP 15 million (USD 0.34 million).

Table 2.2: Descriptive Statistics of Borrowing Households by Lending Institution

	Microfinance Provider	Moneylenders	Relatives & Friends	Banks/ Cooperatives/ Savings & Loan Associations	Government Institutions	Other Lending Institutions
Demographic Characteristics						
Female Household Head	0.225	0.210	0.401	0.192	0.281	0.207
Age of the household head	49.529	48.549	49.839	50.067	51.133	48.884
Education of the household head						
Primary education	0.329	0.366	0.436	0.286	0.142	0.261
Secondary education	0.518	0.467	0.418	0.399	0.417	0.425
Tertiary education	0.140	0.155	0.115	0.305	0.431	0.296
Owns house and/or lot	0.741	0.755	0.752	0.822	0.877	0.827
Household size	5.495	5.405	4.948	5.212	5.171	5.393
Amount of financial assets owned	1,285.947	1,278.312	647.697	13,807.76	12,114.60	8,123.747
in Philippine Peso (US Dollar equivalent)	($28.822)	($28.651)	($14.517)	($309.473)	($271.524)	($182.077)
Economic factors						
Employment status						
Employed	0.301	0.382	0.358	0.384	0.526	0.407
Unemployed	0.087	0.093	0.154	0.076	0.085	0.100
Self-employed	0.439	0.389	0.312	0.392	0.204	0.314
Homemaker	0.059	0.055	0.070	0.042	0.052	0.059
Other Employment Status	0.040	0.023	0.024	0.037	0.057	0.055
Geographic Factors						
Class of Municipality						
Cities	0.234	0.283	0.188	0.189	0.332	0.297
1st class municipality	0.248	0.264	0.312	0.272	0.289	0.315
2nd class municipality	0.110	0.110	0.127	0.141	0.066	0.098
3rd class municipality	0.168	0.153	0.154	0.122	0.081	0.114
4th class municipality	0.168	0.127	0.173	0.149	0.147	0.130

(Continued)

Table 2.2: Continued

	Microfinance Provider	Moneylenders	Relatives & Friends	Banks/ Cooperatives/ Savings & Loan Associations	Government Institutions	Other Lending Institutions
5^{th} and 6^{th} class municipality	0.072	0.063	0.045	0.127	0.085	0.047
No. of Observations	529	988	330	646	211	1,042

Note: Estimated using the 2014 Consumer Finance Survey

Table 2.3: Multivariate Probit Model Estimated Average Marginal Effects of Household's Attributes on Choice of Lender

	Sample: Borrowers (borrowed =1)					
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**	**Other Lending Institutions**
	(1)	(2)	(3)	(4)	(5)	(6)
Female Household Head	0.090	0.045	-0.111	-0.059	0.006	-0.034
	(0.069)	(0.062)	(0.083)	(0.070)	(0.095)	(0.064)
Age	0.003	-0.004**	0.000	0.006**	0.010***	-0.003
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Education Level						
Primary education	0.187	0.412**	-0.236	0.290	-0.183	-0.247
	(0.216)	(0.181)	(0.203)	(0.235)	(0.344)	(0.182)
Secondary education	0.298	0.314*	-0.428**	0.301	0.171	-0.156
	(0.214)	(0.180)	(0.203)	(0.235)	(0.340)	(0.180)
Tertiary education	-0.066	0.109	-0.630***	0.598**	0.535	0.207
	(0.221)	(0.185)	(0.212)	(0.238)	(0.342)	(0.184)
Household Size	0.024**	0.011	-0.039***	-0.012	-0.006	0.016
	(0.010)	(0.010)	(0.014)	(0.011)	(0.015)	(0.010)
Owns house and/or lot	-0.232***	-0.136**	-0.099	0.077	0.331***	0.233***
	(0.064)	(0.057)	(0.073)	(0.066)	(0.102)	(0.060)
Amount of financial assets owned	0.007	-0.049***	-0.040***	0.064***	0.006	0.003
	(0.007)	(0.007)	(0.010)	(0.007)	(0.009)	(0.006)
Employment status						
employed	0.008	-0.024	-0.016	-0.038	-0.040	0.042**
	(0.023)	(0.021)	(0.036)	(0.023)	(0.028)	(0.019)
unemployed	-0.071	0.079	0.302	0.022	-0.065	-0.211*
	(0.149)	(0.133)	(0.204)	(0.150)	(0.185)	(0.126)
self-employed	0.176***	0.096*	-0.105	0.050	-0.356***	-0.193***
	(0.060)	(0.054)	(0.075)	(0.059)	(0.086)	(0.055)

(Continued)

Table 2.3: Continued

	Sample: Borrowers (borrowed =1)					
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**	**Other Lending Institutions**
	(1)	(2)	(3)	(4)	(5)	(6)
homemaker	-0.035	0.159	0.258	0.163	0.123	-0.309*
	(0.218)	(0.197)	(0.314)	(0.221)	(0.274)	(0.184)
Log Pseudolikelihood value	-8,041.007					
Wald test χ^2	631.77					
LR test of ρ_{ki}	1,161.26					
No. of Observations	3,297					

Source of data: 2014 Consumer Finance Survey

Notes: Dummies for the class of municipalities were constructed and simulated but were not presented in the table for brevity. Robust standard errors are in parenthesis. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 2.4: Seemingly Unrelated Regression Model Estimated Parameters of Household's Attributes on Choice of Lender

	Sample: Borrowers (amount if borrowed =1)					
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**	**Other Lending Institutions**
	(1)	(2)	(3)	(4)	(5)	(6)
Female Household Head	0.179	0.078	-0.173	-0.155	-0.048	-0.227
	(0.179)	(0.220)	(0.138)	(0.205)	(0.122)	(0.235)
Age	0.011*	-0.009	0.003	0.016**	0.010**	-0.021***
	(0.006)	(0.007)	(0.005)	(0.007)	(0.004)	(0.008)
Education Level						
Primary education	0.303	1.428**	-0.550	0.597	-0.244	-0.420
	(0.534)	(0.659)	(0.413)	(0.614)	(0.365)	(0.704)
Secondary education	0.558	1.175*	-0.860**	0.672	0.107	0.164
	(0.529)	(0.653)	(0.409)	(0.608)	(0.362)	(0.697)
Tertiary education	-0.178	0.553	-1.166***	1.840***	0.847**	1.510**
	(0.540)	(0.667)	(0.417)	(0.621)	(0.370)	(0.712)
Household Size	0.065**	0.032	-0.059***	-0.031	-0.009	0.078**
	(0.028)	(0.035)	(0.022)	(0.033)	(0.019)	(0.038)
Owns house and/or lot	-0.459***	-0.275	-0.024	0.259	0.377***	0.386*
	(0.162)	(0.200)	(0.125)	(0.186)	(0.111)	(0.213)
Amount of financial assets owned	0.010	-0.155***	-0.050***	0.228***	0.007	0.029
	(0.018)	(0.022)	(0.014)	(0.021)	(0.012)	(0.024)
Employment status						
employed	0.049	-0.076	-0.066	-0.133*	-0.025	0.137*
	(0.059)	(0.073)	(0.046)	(0.068)	(0.040)	(0.078)
unemployed	-0.307	0.307	0.793***	0.089	-0.309	-0.828*
	(0.373)	(0.460)	(0.288)	(0.428)	(0.255)	(0.491)
self-employed	0.430***	0.319*	-0.150	0.064	-0.520***	-0.653***
	(0.154)	(0.190)	(0.119)	(0.177)	(0.106)	(0.203)

(Continued)

Table 2.4: Continued

	Sample: Borrowers (amount if borrowed =1)					
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**	**Other Lending Institutions**
	(1)	(2)	(3)	(4)	(5)	(6)
homemaker	-0.299	0.527	0.879**	0.604	-0.233	-0.986
	(0.560)	(0.691)	(0.433)	(0.644)	(0.383)	(0.738)
R^2	0.018	0.032	0.028	0.080	0.045	0.040
χ^2	56.82	101.24	88.21	269.18	147.65	128.65
No. of Observations	3,108					

Source of data: 2014 Consumer Finance Survey

Notes: Dummies for the class of municipalities were constructed and simulated but were not presented in the table for brevity. Robust standard errors are in parenthesis. ***, **, and * represent statistical significance at 1%, 5%, and 10%, respectively.

Table 2.5: Multivariate Probit Model Correlation Coefficients Between Household's Choice of Lenders

		Sample: Borrower			
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**
Moneylender	-0.290***				
	(0.024)				
Relatives & Friends	-0.104***	-0.264***			
	(0.028)	(0.029)			
Banks/Cooperatives/Savings & Loan Associations	-0.211***	-0.217***	-0.074**		
	(0.027)	(0.026)	(0.029)		
Government Institutions	-0.042	-0.150***	-0.013	0.034	
	(0.032)	(0.034)	(0.042)	(0.038)	
Other Lending Institutions	-0.232***	-0.333***	-0.158***	-0.162***	-0.094***
	(0.029)	(0.026)	(0.029)	(0.029)	(0.033)

Notes: Robust standard errors are in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 2.6: Multivariate Probit Model Correlation Coefficients Between Poor Household's Choice of Lenders

		Sample: Borrower			
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**
Moneylender	0.006				
	(0.028)				
Relatives & Friends	0.004	0.031			
	(0.044)	(0.038)			
Banks/Cooperatives/Savings & Loan Associations	-0.045	0.094***	0.027		
	(0.033)	(0.030)	(0.034)		
Government Institutions	0.029	0.097**	0.085*	0.318***	
	(0.045)	(0.039)	(0.045)	(0.036)	
Other Lending Institutions	0.055**	0.076***	0.024	0.133***	0.104***
	(0.028)	(0.026)	(0.030)	(0.027)	(0.030)

Notes: A household is considered poor if it lives below PHP 10,727 (USD241.63), on average, for a family of five per month in 2018. Robust standard errors are in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 2.7: Multivariate Probit Model Correlation Coefficients Between Female-Headed Household's Choice of Lenders

		Sample: Borrower			
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**
Moneylender	-0.027				
	(0.059)				
Relatives & Friends	0.086	-0.119			
	(0.083)	(0.080)			
Banks/Cooperatives/Savings & Loan Associations	-0.022	0.015	-0.027		
	(0.081)	(0.066)	(0.080)		
Government Institutions	0.023	0.073	-0.071	0.352***	
	(0.102)	(0.091)	(0.110)	(0.077)	
Other Lending Institutions	-0.022**	0.129	-0.039	0.053	0.112*
	(0.061)	(0.052)	(0.063)	(0.053)	(0.062)

Notes: Robust standard errors are in parenthesis. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 2.8: Seemingly Unrelated Regression Correlation Matrix of Residuals

		Sample: Borrower			
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**
		Joint Significance Test[§]			
Moneylender	-0.244				
Relatives & Friends	-0.119	-0.172			
Banks/Cooperatives/Savings & Loan Associations	-0.184	-0.197	-0.093		
Government Institutions	-0.082	-0.096	-0.055	0.024	
Other Lending Institutions	-0.171	-0.248	-0.153	-0.173	-0.095
		Pairwise Test[¥]			
Moneylender	-0.229***				
Relatives & Friends	-0.112***	-0.158***			
Banks/Cooperatives/Savings & Loan Associations	-0.178***	-0.183***	-0.089***		
Government Institutions	-0.078***	-0.084***	-0.052***	0.027	
Other Lending Institutions	-0.171***	-0.247***	-0.153***	-0.171***	-0.095***

§ Breusch-Pagan test of independence: $chi^2(15) = 1{,}111.103$

¥ Breusch-Pagan test of independence where ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 2.9: Poor Household's Seemingly Unrelated Regression Correlation Matrix of Residuals

		Sample: Borrower			
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**
		Joint Significance Test[§]			
Moneylender	-0.241				
Relatives & Friends	-0.119	-0.170			
Banks/Cooperatives/Savings & Loan Associations	-0.186	-0.194	-0.094		
Government Institutions	-0.086	-0.097	-0.056	0.023	
Other Lending Institutions	-0.173	-0.252	-0.156	-0.171	-0.095
		Pairwise Test[¥]			
Moneylender	-0.226***				
Relatives & Friends	-0.112***	-0.156***			
Banks/Cooperatives/Savings & Loan Associations	-0.180***	-0.180***	-0.089***		
Government Institutions	-0.082***	-0.084***	-0.053***	0.026	
Other Lending Institutions	-0.172***	-0.251***	-0.155***	-0.170***	-0.095***

§ Breusch-Pagan test of independence: $chi^2(15) = 1{,}051.77$

¥ Breusch-Pagan test of independence where ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 2.10: Female-Headed Household's Seemingly Unrelated Regression Correlation Matrix of Residuals

		Sample: Borrower			
	Microfinance Providers	**Moneylenders**	**Relatives & Friends**	**Banks/ Cooperatives/ Savings & Loan Associations**	**Government Institutions**
		Joint Significance Test[§]			
Moneylender	-0.278				
Relatives & Friends	-0.087	-0.188			
Banks/Cooperatives/Savings & Loan Associations	-0.193	-0.203	-0.114		
Government Institutions	-0.064	-0.117	-0.086	0.111	
Other Lending Institutions	-0.206	-0.257	-0.142	-0.166	-0.055
		Pairwise Test[¥]			
Moneylender	-0.258***				
Relatives & Friends	-0.083**	-0.176***			
Banks/Cooperatives/Savings & Loan Associations	-0.191***	-0.192***	-0.109***		
Government Institutions	-0.066*	-0.088**	-0.076**	0.101***	
Other Lending Institutions	-0.203***	-0.254***	-0.140***	-0.164***	-0.059

§ Breusch-Pagan test of independence: $chi^2(15) = 263.97$

¥ Breusch-Pagan test of independence where ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 2.11: Consolidated NGOs Matrix of Selected Loan Terms

Institution Name	Aakay ang MILAMDEC Microfinance Foundation, Inc.	Ahon sa Hirap Inc.	Alalay sa Kaunlaran, Inc.	ARDCI NGO Group, Inc.	ASA Philippines
Loan Type	***Agriculture*** ***Regular***	***Center loan*** ***education*** ***General*** ***Group*** ***House repair*** ***Recovery***	***Group*** ***Agriculture*** ***Housing*** ***Individual***	***Micro Business***	***Microfinance loan***
Approximate % female clients	80.0% - 100.0%	80.0% - 100.0%	20.0% - 100.0%	60.0% - 80.0%	80.0% - 100.0%
Approximate % urban clients	0.0% - 40.0%	20.0% - 40.0%	0.0% - 20.0%	20.0% - 40.0%	20.0% - 40.0%
Lending Type	Individual Self-Help Group	Solidarity group	Individual Solidarity group Village banking	Individual Solidarity group	Individual
Loan Purpose	Income generation Agriculture	Income generation Other household finance Payment of past due of willful member Education Mortgage/housing	Income generation Agriculture Mortgage/Housing	Income generation	Income generation
Eligibility	Men Women Must run a business Must own a home or land	Women	Men Women Must be engaged in business/agri-business Must be salaried worker Existing ASKI client/staff	Men Women	Women Must run a business
Minimum loan size	PHP 3,000.0	PHP 700.0	PHP 5,000.0	PHP 10,000.0	PHP 1,000.0
Maximum loan size	PHP 130,000.0	PHP 50,000.0	PHP 300,000.0	PHP 200,000.0	PHP 120,000.0
Loan Term					
Shortest	6.0 months	2.0 months	4.0 months	3.0 months	3.0 months

(Continued)

Table 2.11: Continued

Institution Name	Aakay ang MILAMDEC Microfinance Foundation, Inc.	Ahon sa Hirap Inc.	Alalay sa Kaunlaran, Inc.	ARDCI NGO Group, Inc.	ASA Philippines
Longest	12.0 months	24.0 months	24.0 months	12.0 months	6.0 months
Grace period usage					
Repayment Frequency	Weekly Single end payment	Weekly	Weekly Every 2 weeks Monthly Single end payment	Weekly Monthly	Weekly
Interest Rate	Fixed	Fixed	Fixed	-	Fixed
Lowest	20.0%	0.0%-25.0%	1.75%-2.0%	2.0%	30.0%
Highest	20.0%	0.0%-25.0%	1.75%-3.0%	2.0%	30.0%
Period	Yearly	Yearly	Monthly	Monthly	Yearly
Compulsory Deposit	Required Indicated on the repayment schedule	No Required Borrowers control deposit in their group	Required Indicated on the repayment schedule	Required	Required
Deposit before or at disbursement					
% loan amount deposited	30.0%	0.0%	0.0%	10.0%	0.0%
Fixed-amount deposited	PHP 0.0	PHP 0.0-PHP 5.0	PHP 0.0	PHP 0.0	PHP 60.0
Deposit during period payments					
% loan amount deposited	0.0%-30.0%	0.0%	10.0%	0.0%	0.0%
Fixed-amount deposited	PHP 0.0 – PHP 50.0	PHP 0.0-PHP 5.0	PHP 0.0	PHP 30.0	PHP 60.0
Conditions on access to deposit	When leaving Access during	When leaving	Access during	When leaving	Access during
Institution Name	**FCB Foundation, Inc.**	**Jaime V. Ongpin Foundation, Inc.**	**Kasagana-Ka Development Center, Inc.**	**Community Economic Ventures, Inc.**	**ECLOF Philippines Foundation, Inc.**
Loan Type	***Individual***	***Microloan***	***Educational*** ***Health*** ***Enterprise***	***Microenterprise*** ***Enterprise*** ***Agriculture***	***Agricultural asset acquisition and carabao*** ***Microenterprise***

(Continued)

Table 2.11: Continued

Institution Type	FCB Foundation, Inc.	Jaime V. Ongpin Foundation, Inc.	Kasagana-Ka Development Center, Inc.	Community Economic Ventures, Inc.	ECLOF Philippines Foundation, Inc.
Approximate % female clients	60.0% - 80.0%	80.0% - 100.0%	80.0% - 100.0%	20.0% - 80.0%	60.0% - 100.0%
Approximate % urban clients	20.0% - 40.0%	60.0% - 80.0%	80.0% - 100.0%	0.0% - 40.0%	0.0% - 80.0%
Lending Type	Individual Solidarity group	Individual	Individual Borrower needs 2 co-makers as guarantors	Individual	Individual Solidarity group
Loan Purpose	Income generation	Income generation	Education Health Income generation	Income generation Agriculture Hog raising	Income generation Leasing or purchase of agricultural equipment Purchase of carabao
Eligibility	Men Women Must have experience running a business	Men Women Must run a business Must have a max net income of 10,000 per family of 5	Men Women Must own a home or land Has an existing K-Negosyo loan Must be in a loan cycle 2 of business loan	Men Women Farmer Must run a business Must be specific age group	Men Women Must run a business Must have a farm to manage Farmer-client who are at least on their 3rd cycle up
Minimum loan size	PHP 3,000.0	PHP 2,000.0	PHP 380.0	PHP 2,000.0	PHP 5,000.0
Maximum loan size	PHP 150,000.0	PHP 150,000.0	PHP 150,000.0	PHP 150,000.0	PHP 150,000.0
Loan Term					
Shortest	3.0 months	4.7 months	3.0 months	4.0 months	3.0 months
Longest	64.0 months	12.0 months	9.0 months	24.0 months	24.0 months
Grace period usage				100.0%	100.0%
Repayment Frequency	Weekly Monthly	Weekly	Weekly	Weekly Every 2 weeks Monthly Single end payment Irregular payment	Weekly Every 2 weeks Monthly Irregular payments Single end payments
Interest Rate	Fixed	Fixed	Fixed	Fixed	Fixed
Lowest	2.0%	2.5%	2.5%	2.5%	2.0%-3.0%

(Continued)

Table 2.11: Continued

Institution Type	FCB Foundation, Inc.	Jaime V. Ongpin Foundation, Inc.	Kasagana-Ka Development Center, Inc.	Community Economic Ventures, Inc.	ECLOF Philippines Foundation, Inc.
Highest	2.0%	2.5%	2.5%	2.5%	2.5%-4.5%
Period	Monthly	Monthly	Monthly	Monthly	Monthly
Compulsory Deposit	Required	Required	Required Indicated in the repayment schedule	Required Indicated in the repayment schedule	Required Indicated in the repayment schedule
Deposit before or at disbursement					
% loan amount deposited	2.0%-4.0%	20.0%	0.0%	20.0%	0.0%
Fixed-amount deposited	PHP 0.0	PHP 0.0	PHP 0.0	PHP 0.0	PHP 0.0
Deposit during period payments					
% loan amount deposited	0.0%	0.0%	0.0%	PHP 0.0	1.0%-10.0%
Fixed-amount deposited	PHP 0.0-PHP 20.0	PHP 50.0	PHP 0.0-PHP 55.0	PHP 20.0-PHP 200.0	PHP 0.0
Conditions on access to deposit	When leaving	Access during	Access during	Access during When leaving	When leaving

Institution Type	Kazama Grameen, Inc.	Kabalikat para sa Maunlad na Buhay, Inc.	Rangtay sa Pagrang-ay, Inc.	Taytay sa Kauswagan, Inc.	Negros Women for Tomorrow Foundation, Inc.	Tulay sa Pag-unlad, Inc.
Loan Type	***Multi-Purpose Business***	***Group***	***Agriculture Business Livestock***	***Okey***	***General Environment friendly products Asset acquisition***	***Education Housing Livestock Health Microenterprise Asset acquisition Agriculture***
Approximate % female clients	80.0% - 100.0%	80.0% - 100.0%	40.0% - 100.0%	60.0% - 100.0%	80.0% - 100.0%	0.0% - 100.0%
Approximate % urban clients	20.0% - 40.0%	60.0% - 80.0%	0.0% - 20.0%	20.0% - 60.0%	0.0% - 40.0%	0.0% - 100.0%

(Continued)

Table 2.11: Continued

Institution Type	Kazama Grameen, Inc.	Kabalikat para sa Maunlad na Buhay, Inc.	Rangtay sa Pagrang-ay, Inc.	Taytay sa Kauswagan, Inc.	Negros Women for Tomorrow Foundation, Inc.	Tulay sa Pag-unlad, Inc.
Lending Type	Individual Solidarity group Self-Help group	Solidarity group between 30 to 40 individuals	Individual Solidarity group	Individual Co-makership of up to 2 co-makers	Individual Solidarity group Village banking	Individual Solidarity group Village banking
Loan Purpose	Income generation Any purpose Additional or start-up capital	Income generation	Income generation Agriculture Livestock Purchase of farm inputs Any purpose	Income generation Other household finance	Income generation Mortgage/housing Consumer loan Education	Education Mortgage/housing Sanitation Livestock Other household finance Income generation Agriculture Rice farmers
Eligibility	Men Women Must run a business Must own a home or land Must be specific age group	Women Must run a business	Men Women Engaged in farming activities Must be salaried worker Barangay Officials	Men Women Must run a business	Men Women Must run a business Must own house/land	Men Women Must be member of TSPI Kabuhayan Program Must have collateral or a co-worker TKP group member TKP clients with school-age children Must run a business Must have proof of right to construct house Land tenant with at least 5 years of farming experience

(Continued)

Table 2.11: Continued

Institution Type	Kazama Grameen, Inc.	Kabalikat para sa Maunlad na Buhay, Inc.	Rangtay sa Pagrang-ay, Inc.	Taytay sa Kauswagan, Inc.	Negros Women for Tomorrow Foundation, Inc.	Tulay sa Pag-unlad, Inc.
Eligibility						Has access to irrigation
Minimum loan size	PHP 2,000.0	PHP 4,000.0	PHP 1,000.0	PHP 3,000.0	PHP 1,000.0	PHP 300.0
Maximum loan size	PHP 150,000.0	PHP 20,000.0	PHP 50,000.0	PHP 50,000.0	PHP 150,000.0	PHP 150,000.0
Loan Term						
Shortest	3.0 months	6.0 months	3.0 months	3.0 months	3.0 months	3.0 months
Longest	12.0 months	6.0 months	12.0 months	6.0 months	36.0 months	60.0 months
Grace period usage						
Repayment Frequency	Weekly	Weekly	Weekly Every 2 weeks Monthly Quarterly Single end payment	Weekly Monthly	Weekly	Weekly Every 2 weeks Monthly Single end payment
Interest Rate	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Lowest	1.7%-20.0%	3.3%	3.0%-40.0%	0.8%-2.5%	2.5%	1.0%-3.0%
Highest	1.7%-20.0%	3.3%	3.0%-40.0%	0.8%-2.5%	2.5%	1.0%-3.0%
Period	Monthly Yearly	Monthly	Monthly Yearly	Weekly Monthly	Monthly	Monthly
Compulsory Deposit	Required	Required Borrowers control deposit in their group	Required Indicated in the repayment schedule	Required Indicated in the repayment schedule Borrowers control deposit in their group	Required/Some Indicated in the repayment schedule	Required
Deposit before or at disbursement						
% loan amount deposited	0.0%-5.0%	5.0%	0.0%-5.0%	0.0%	0.0%-10.0%	0.0%-10.0%
Fixed-amount deposited	PHP 0.0	PHP 0.0	PHP 0.0	PHP 0.0-PHP 150.0	PHP 0.0	PHP 0.0
Deposit during period payments						
% loan amount deposited	0.0%	0.0%	PHP 0.0	0.0%-10.0%	0.0%	0.0%
Fixed-amount deposited	PHP 0.0-PHP 50.0	PHP 40.0	PHP 40.0-PHP 200.0	PHP 0.0-PHP 1,500	PHP 0.0-PHP 1.0	PHP 0.0-PHP 200.0

(Continued)

Table 2.11: Continued

Institution Type	Kazama Grameen, Inc.	Kabalikat para sa Maunlad na Buhay, Inc.	Rangtay sa Pagrang-ay, Inc.	Taytay sa Kauswagan, Inc.	Negros Women for Tomorrow Foundation, Inc.	Tulay sa Pag-unlad, Inc.
Conditions on access to deposit	Access during	When leaving	End term	Access during	Access during	Access during When leaving

Notes: PHP = Philippine Peso. For brevity, details of each loan type are not presented. Detailed information on the loans is available from the author upon request.
Source of data: https://www.mftransparency.org/microfinance-pricing/philippines/ and as of November 2011. The MicroFinance Transparency, launched in July 2008, was established to promote the welfare of poor micro-entrepreneurs and integrity of microfinance as a poverty alleviation practice. However, the organization is now defunct and no longer operating but the website is still available potentially until March 2023.

Table 2.12: Consolidated Rural Banks Matrix of Selected Loan Terms

Institution Type	Mallig Plains Rural Bank (Isabela), Inc.	GM Bank of Luzon, Inc.	1st Valley Bank, Inc. A Rural Bank	Katipunan Bank, Inc.	People Bank of Caraga
Loan Type	***Microenterprise***	***Microenterprise*** ***MicroAgriculture***	***Barangay & Local Government Unit*** ***Livelihood*** ***Loans for Teachers*** ***Microfinance***	***Microenterprise*** ***Individual***	***Allied Undertakings*** ***Cycled/Enterprise*** ***Farm financing*** ***Micro-Agri***
Approximate % female clients	80.0% - 100.0%	20.0% - 80.0%	20.0%-100.0%	60.0% - 100.0%	0.0% - 100.0%
Approximate % urban clients	0.0% - 20.0%	0.0% - 100.0%	20.0%-60.0%	40.0% - 60.0%	0.0% - 40.0%
Lending Type	Individual Solidarity group	Individual Solidarity group Self-help group	Individual Self-Help group	Individual Solidarity group MABS/ASA Approach	Solidarity group
Loan Purpose	Income generation	Income generation	Income generation Agriculture Any purpose Mortgage/housing	Income generation	Income generation
Eligibility	Men Women Must run a business	Men Women Must run a business Must own a home or land Must be specific age group	Men Women Must be salaried worker Must be specific age group 18-70 years old Barangay & local government unit officials	Men Women Must run a business Must be specific age group 18 – 65 years old	Men Women Must run a business Must be specific age group Age must be 18-65 years old
Minimum loan size	PHP 5,000.0	PHP 3,000.0	PHP 3,000.0	PHP 1,000.0	PHP 3,000.0
Maximum loan size	PHP 100,000.0	PHP 150,000.0	PHP 250,000.0	PHP 150,000.0	PHP 150,000.0
Loan Term					
Shortest	3.0 months	3.0 months	0.9 months	1.0 months	6.0 months
Longest	12.0 months	12.0 months	24.0 months	12.0 months	12.0 months
Grace period usage					
Repayment Frequency	Weekly Every 2 weeks Monthly	Weekly Every 2 weeks Monthly	Weekly Every 2 weeks Every 4 weeks	Weekly Every 2 weeks	Weekly Single end payment Irregular payment

(Continued)

Table 2.12: Continued

Institution Type	Mallig Plains Rural Bank (Isabela), Inc.	GM Bank of Luzon, Inc.	1st Valley Bank, Inc. A Rural Bank	Katipunan Bank, Inc.	People Bank of Caraga
Interest Rate	Fixed	Fixed	Fixed	Fixed	Fixed
Lowest	24.0%-30.0%	2.2%-2.5%	2.5%-18.0%	2.5%	24.0%-28.0%
Highest	24.0%-30.0%	2.2%-3.0%	2.5%-20.0%	2.5%	24.0%-28.0%
Period	Yearly	Monthly	Monthly Yearly	Monthly	Yearly
Compulsory Deposit	Required Indicated in the repayment schedule	Required	Required Indicated in the repayment schedule	Required	
Deposit before or at disbursement					
% loan amount deposited	0.0%	0.0%	0.0%-5.0%	0.0%	0.0%
Fixed-amount deposited	PHP 0.0	PHP 100.0	PHP 0.0- PHP 1,000.0	PHP 100.0	PHP 100.0
Deposit during period payments					
% loan amount deposited	5.0%	10.0%-16.0%	0.0%	0.0%-10.0%	0.4%
Fixed-amount deposited	PHP 0.0	PHP 0.0	PHP 0.0- PHP 10.0	PHP 0.0- PHP 45.0	PHP 0.0
Conditions on access to deposit	End term	When leaving End term	Final payment	Access during	Access during

Notes: PHP = Philippine Peso. For brevity, details of each loan type are not presented. Detailed information on the loans is available from the author upon request.
Source of data: https://www.mftransparency.org/microfinance-pricing/philippines/ and as of November 2011. The MicroFinance Transparency, launched in July 2008, was established to promote the welfare of poor micro-entrepreneurs and integrity of microfinance as a poverty alleviation practice. However, the organization is now defunct and no longer operating but the website is still available potentially until March 2023.

Table 2.13: Consolidated Credit Union/Cooperatives Matrix of Selected Loan Terms

Institution Type	Maranding Women Investors Multipurpose Cooperative	Paglaum Multi-Purpose Cooperative
Loan Type	***Individual*** ***Farm*** ***Life Insurance*** ***Microenterprise***	***Barangay Official Livelihood Assistance*** ***Emergency*** ***Housing*** ***Motorcycle*** ***Pension*** ***Micro-Regular*** ***Regular***
Approximate % female clients	80.0% - 100.0%	60.0% - 100.0%
Approximate % urban clients	0.0% - 20.0%	0.0% - 20.0%
Lending Type	Individual Solidarity group Self-Help group	Individual Self-Help group Solidarity group Village banking
Loan Purpose	Income generation Agriculture Insurance Additional capital	Income generation Any purpose Other finance Mortgage/housing Consumer loan Education Other household finance
Eligibility	Men Women Must run a business Must own a home/land Must be a salaried worker Must be specific age group 18 – 69 years old	Men Women Must run a business Must be cooperative member Barangay Officials Open to all regular and PDP members who are MIGS <60 years old Must be pension holder Must be <80 years old
Minimum loan size	PHP 1,380.0	PHP 500.0
Maximum loan size	PHP 300,000.0	PHP 1,000,000.0

(Continued)

Table 2.13: Continued

Institution Type	Maranding Women Investors Multipurpose Cooperative	Paglaum Multi-Purpose Cooperative
Loan Term		
Shortest	2.0 months	1.0 months
Longest	12.0 months	36.0 months
Grace period usage		
Repayment Frequency	Daily Weekly Every 2 weeks Monthly	Daily Weekly Every 2 weeks Monthly Every 12 months
Interest Rate	Fixed	Fixed
Lowest	1.5%-3.0%	1.8%-3.0%
Highest	1.5%-5.0%	1.8%-3.0%
Period	Monthly	Monthly
Compulsory Deposit	Required	Required
Deposit before or at disbursement		
% loan amount deposited	5.0%-20.0%	6.5%
Fixed-amount deposited	PHP 0.0- PHP 100.0	PHP 0.0
Deposit during period payments		
% loan amount deposited	0.0%	0.0%
Fixed-amount deposited	PHP 80.0- PHP 90.0	PHP 0.0- PHP 26.0
Conditions on access to deposit	Access during	Access during

Notes: PHP = Philippine Peso. For brevity, details of each loan type are not presented. Detailed information on the loans is available from the author upon request. Source of data: https://www.mftransparency.org/microfinance-pricing/philippines/ and as of November 2011. The MicroFinance Transparency, launched in July 2008, was established to promote the welfare of poor micro-entrepreneurs and integrity of microfinance as a poverty alleviation practice. However, the organization is now defunct and no longer operating but the website is still available potentially until March 2023.

Chapter 3

Microfinance-Oriented Banks and Welfare Outcomes

Although evidence on the impact of microfinance is continuously accumulating, little is known about how different lengths of exposure to microfinance institutions affect household welfare. This study addresses the issue by evaluating a household-level panel data and a unique event in the Philippines when the microfinance industry was mainstreamed and commercialized in the banking sector with microfinance-oriented banks (MOBs) opening in 2004. I find an average positive effect on education and negative effect on wage work for households with short-term exposure to MOB presence, but these effects materialize only after the closure of the respective MOBs. When MOBs offer households longer access to microfinance, the effects diminish or even regress. Consistent with the literature, it is found that MOB presence is not transformative enough to lift the poor out of poverty. I, however, argue that MOB presence may reduce vulnerability as it affords households options to be entrepreneurs and invest more in human capital. Heterogeneity analysis further reveals that women gain more from MOB presence and the effect is stronger for non-poor households.

3.1 Introduction

Microfinance has been positioned as an important financial instrument for poverty alleviation and socioeconomic development. Its proliferation is fueled by the belief that simply "lending to the poor or women" will indeed improve their economic (e.g., wealth and income) and social (e.g., education and health status) welfare (Buera, Kaboski, & Shin, 2012; Coleman, 2006). Many empirical studies have been conducted to understand these impacts of microfinance on income, employment, consumption, asset accumulation, and profits (Angelucci, Karlan, & Zinman, 2015; Attanasio, Augsburg, De Haas, Fitzsimons, & Harmgart, 2015; Augsburg, De Haas, Harmgart, & Meghir, 2012; Kaboski & Townsend,

2012; Karlan & Zinman, 2011; Morduch, 1998; Pitt & Khandker, 1998). However, they are mostly concerned with the short-term effects, and very few studies evaluate medium- and long-term effects, perhaps due to the difficulty of obtaining data with longer time interval between pre- and post-intervention surveys—approximately three years or longer.

To the best of my knowledge, only two studies exist that explicitly investigate the differential impacts of microcredit in terms of duration, and the results are mixed. Using data from Bangladesh, Islam (2011) finds that gains from microcredit programs vary with the length of participation and the benefits are larger for those participating in the program longer. He also finds that benefits may continue even after the participant leaves the program, but their magnitude diminishes. On the other hand, Banerjee, Duflo, Glennester, and Kinnan (2015), in their study on a group lending microcredit program in Hyderabad, India, find no significant short- or long-term impact on non-durable consumption, education, health, or women empowerment after the introduction of microfinance[23].

My study aims to complement the limited literature by evaluating whether—and to what extent—the impact of microfinance varies with the length of exposure. I expand the scope of the existing studies in two important respects. First, as will be explained in more detail below, I will not only quantify the effect of *short-* and *long-term* access to microfinance but also differentiate *immediate*, *incremental*, *persistent*, and *total* (or *net*) effects, depending on the duration of exposure to microfinance. For example, a household that has access to microfinance for only a year (*short-term*) may see *immediate* effects within a few years, but will have no *persistent* effects several years after the access is lost. Second, the study further

[23] Microfinance and microcredit are used interchangeably in this study.

investigates heterogeneous effects with respect to socio-economic classes, that is, whether the impact of microfinance differs by poverty level and gender. The study's approach is closest to that of Islam (2011), but his study does not differentiate the effects in terms of poverty level and gender of the borrower.

I rely on a case from the Philippines where the microfinance industry has been growing on a commercial (i.e., for-profit lenders and extending individual liability credit) basis. The BSP, or Central Bank of the Philippines, partially lifted the moratorium on the establishment of new banks in 2001, as long as the new banks were to be microfinance oriented. I scrutinize this event as a quasi-experiment with nationally representative panel data from 2003, 2006, and 2009 taken from the Family Income and Expenditure Survey (FIES) conducted by the PSA. The study's analyses are limited to assessing the effect of accessibility to microfinance as there are no available panel dataset on actual borrowing from microfinance institutions at the time of study.

Given the dataset, I consider 2003 as the *pre-intervention* period when there are absolutely no MOBs established in any municipalities and 2006 and 2009 as the *post-intervention* periods when MOBs have been established. I then divide our treatment group into three categories: 1) *newcomers*, or those households who live in a municipality having an MOB in 2009 only; 2) *dropouts*, or those living in a municipality having an MOB in 2006 only; and 3) *continuing*, or those living in a municipality having an MOB both in 2006 and 2009. The control group or *never clients* are those households who reside in municipalities with no MOBs. The samples of *newcomers* and *dropouts* represent short-term presence of MOBs in municipalities while *continuing* households represent long-term MOB presence.

Along with these household categories, I further identify the *immediate*, *incremental*, *persistent*, and *total* (or *net*) effects in terms of the length of MOB presence in municipalities. Effects derived from *dropouts* and *continuing* households in 2006 are considered as *immediate* because these households became exposed to microfinance only after 2004. Estimates obtained from *newcomers* in 2009 are also interpreted as *immediate* because the length of microfinance access was short, while those from *dropouts* represent *persistent* effects (i.e., effects that remain even after MOBs cease operation) and those from *continuing* households represent *incremental* effects (i.e., effects that are added to the initial, immediate effects). The combined estimates for 2006 and 2009 of *dropouts* or *continuing* households represent the *total* (or *net*) impact of access to microfinance through MOBs.

To obtain deeper insights into heterogeneity, I further disentangle these impacts depending on poverty level and gender of the recipient as microfinance programs typically target women and poor individuals and also because much of the literature predicts that the impacts of microfinancing may differ depending on the gender and economic class of the recipients (Attanasio et al., 2015; Banerjee, Karlan et al., 2015; Banerjee & Mullainathan, 2010; Crèpon et al., 2015; Dichter & Harper, 2007; Hulme & Mosley, 1996; Khandker, 1998; Kondo, Orbeta, Dingcong, & Infantado, 2008; Tarozzi et al., 2015).

Primary outcomes of interest are the probability of and income from wage work and self-employment as well as consumption expenditures (i.e., food, medical care, alcoholic beverage & tobacco, and education) because microfinance providers target micro-entrepreneurs and the widely used proxies for poverty are income and consumption.

The main challenge in using observational panel data is the endogeneity problem associated with self-selection as well as sample attrition. To address these concerns, I employ a DID household FE technique combined with IPW. The DID-FE addresses the non-random selection of municipalities and households based on their observable attributes as well as time-invariant unobservable attributes (e.g., inherent ability, industriousness, or geographical landscape of the municipality, including climate and susceptibility to natural disaster) that may affect a household's decision to avail microcredit and MOB's choice of location. Meanwhile, the IPW accounts for the sample selection associated with households dropping out of the survey. Finally, I employ the methodology developed by Oster (2019) and Altonji et al. (2005) to check the robustness of treatment effects from the IPW DID-FE model against unobserved confounders.

Results indicate that access to microfinance through MOBs provides households with opportunity to be entrepreneur and spend more on medical care and education. If access to microfinance through MOBs is short-lived, the average positive effect on education and negative effect on the likelihood of and income from wage work may transpire in the period when the MOB ceases operations. The effects diminish or even regress when the presence of MOB in a municipality is long-term. There is also evidence that education expenditure is temporarily reduced to finance the household enterprise. Lastly, MOB presence is more beneficial to matrifocal households and gains are more pronounced among relatively non-poor families.

The rest of this chapter is organized as follows. Section 3.2 offers a brief background on MOBs in the Philippines and the study's data. Section 3.3 outlines estimation strategy.

The results are reported in Section 3.4. Section 3.5 performs test on omitted variables. Lastly, Section 3.6 concludes the chapter.

3.2 Data and Context

3.2.1 Establishment of MOBs

I use a unique event in the Philippines - when the BSP in 2001 and 2005 issued Circular Nos. 273 and 505, respectively - to evaluate the sensitivity to the length of MOB presence in municipalities of the impact estimates on household welfare. This event is unique in that commercial banks ventured into microfinance and opened MOBs in the country. This also formalized mandated loans to basic sectors primarily for their microenterprises and small businesses to enable them to raise their income and improve their living standards (BSP, 2001).

Banks started establishing MOBs only in 2004 (BSP, 2005).[24] Most of these branches can be found in the capital or in cities and first-class municipalities[25] of the three geographic island groups (i.e., Luzon, Visayas, and Mindanao) of the country (Figure 3.1).

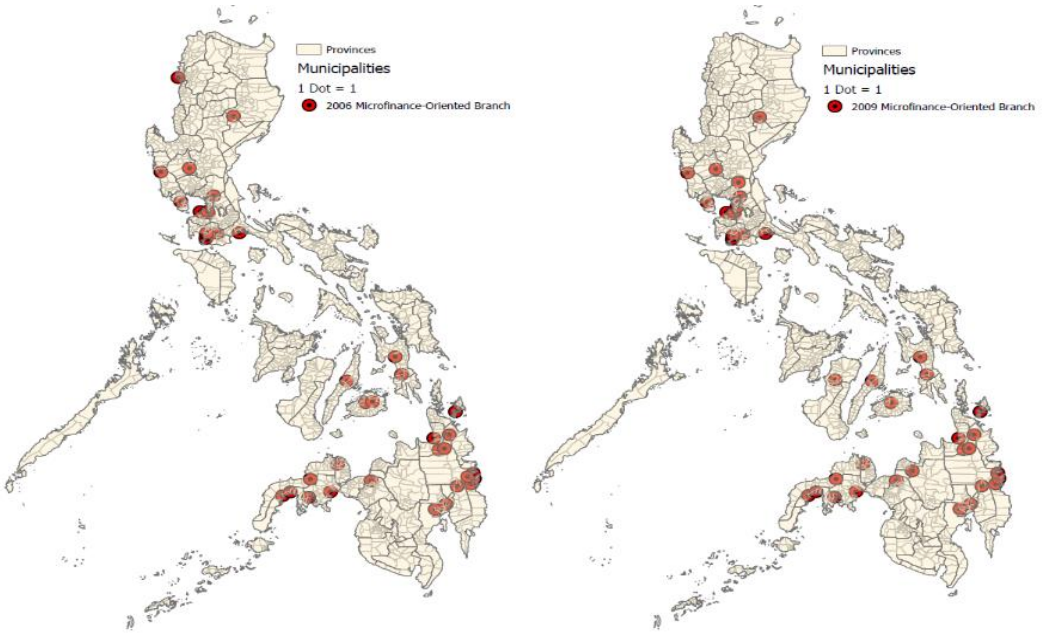
In Figure 3.2, I present client and loan portfolio of MOBs to determine if there are any systematic patterns of client self-selection and MOB location. Most microfinance programs claim that their primary goal is to alleviate rural poverty by delivering credit and other financial services to poor households, especially to the women in those households.

[24] The MOB established beginning 2004 are newly created microfinance-oriented banks and are not a conversion of a regular bank.

[25] This class of municipalities has the highest average annual income at PHP 45 million (USD 1.01 million) or more but less than PHP 55 million (USD 1.24 million).

Such selective targeting may be useful to increase the efficacy but would threaten the identification strategy when I simply compare households with or without access to microfinance through MOBs. This issue will be revisited later in this chapter (Subsection 3.3 Estimation Strategy).

Figure 3.1: Geographical Distribution of Microfinance-Oriented Banks in the Philippines



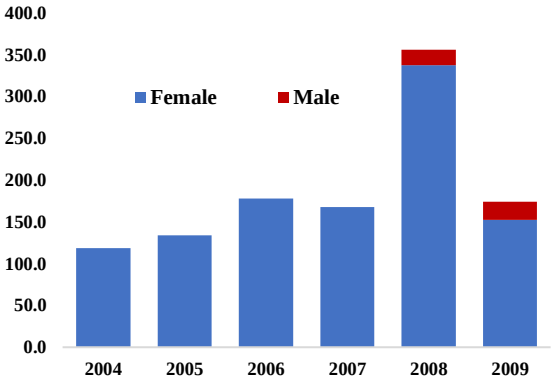
Source of Data: Bangko Sentral ng Pilipinas; data plotted by the Author.

Statistics in Figure 3.2 confirms that the clients served by MOBs are mostly female or from low-income households. Their loan portfolio is comprised of agricultural, microfinance[26], small and medium enterprise, and individual loans, which typically have short-term (up to 365 days) maturity.

[26] The types of loan are agriculture, education, housing, health, microbusiness, capital/start-up capital, multipurpose, salary, life insurance, hospitalization, pension, motorcycle, and so on. Based on BSP Circular No. 694 dated 14 October 2010, microenterprise loans refer to small and short-term loans granted to the basic sectors, on the basis of the borrowers' cash flow, for their microenterprises and small businesses. The

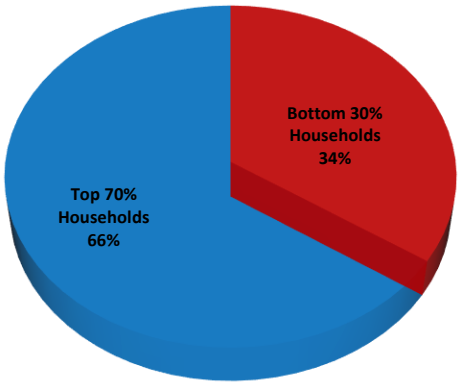
Figure 3.2 Client and Loan Portfolio of Microfinance-Oriented Banks in the Philippines

(a) Number of Active Borrowers: By Gender (As of End-Period Indicated, In Thousand)



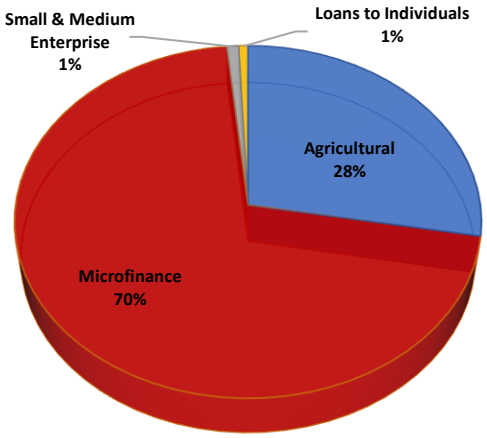
Source of Data: World Bank Database on Mix Market

(b) MFI Borrowers: By Income Decile (For the Period 2011, In Percent)



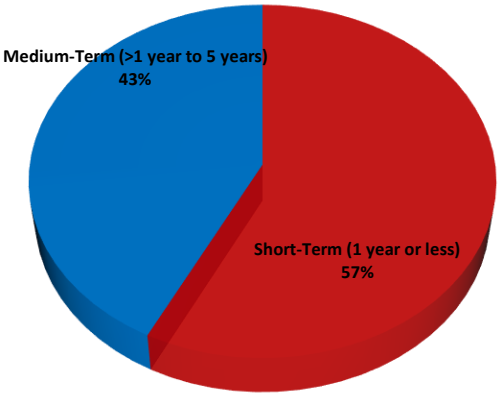
Source of Data: Annual Poverty Indicator Survey (APIS); Philippine Statistics Authority

(c) Gross Loan Portfolio (As of 2010, In Percent)



Source of Data: Bangko Sentral ng Pilipinas

(d) Maturity of Loans (As of 2010, In Percent)



Source of Data: Bangko Sentral ng Pilipinas

Notes: The earliest statistics on microfinance-oriented banks consolidated by the BSP is in 2010 while the APIS prior to 2011 do not have information on household borrowing from microfinance institutions.

3.2.2 Data

The primary data source is the FIES for the year 2003, 2006, and 2009 collected by the PSA. The FIES is a nationwide household survey conducted every three years and

principal amount of a microenterprise loan can be generally pegged at PHP 150,000 (USD 3,325.23). The foreign exchange rate used is the average for 2010 at PHP 45.11, posted by the BSP on its website.

provides information on the level of consumption by item of expenditure as well as sources of income in cash and in kind. It also includes statistics on family size; occupation, age, and level of education of the household head; and other housing characteristics.

The surveys for 2003, 2006, and 2009 comprised 42,094, 38,483, and 38,400 households, respectively, covering all 17 administrative regions in the country. The administrative regions were also the survey's primary sampling unit (PSU). It used two-stage sampling with stratification at the PSU level. In the first stage, random samples of EAs or *barangays* were selected within sampled PSUs (or each region) with probability proportional to EA size (i.e., total number of households); in the second stage, random samples of households were selected within sampled EAs.

However, only 6,529 households or approximately 16 percent of the original sample are used in this study to construct a balanced panel dataset for the period 2003, 2006, and 2009. According to the PSA, the reasons for the small proportion of households that remained in the surveys are that some households felt that the nature of the data being collected is sensitive, some relocated between data collection times, or data collection procedures are aversive or costly to the household being surveyed.

I also use statistics on the number of banks and MOBs in the municipalities compiled by the BSP for the periods 2003, 2006 and 2009. In the dataset, it is observed that it was only in 2004 that banks started to set up MOBs. As stated earlier, the BSP partially lifted the moratorium on the establishment of new banks in 2001, which paved way for MOBs to be set up in municipalities. There are 24 municipalities that have MOBs. Of these, 21 have only 1 MOB established in the area, 2 municipalities have 2 MOBs each, and 1 municipality has

3 MOBs. Two municipalities out of the 24 have no other access to formal financial institutions but MOBs. I also observed that there were three reported MOBs that closed in 2009 and three that opened.

This different timing of opening and closing allows the identification of different treatment and control groups in terms of time (i.e., *pre-intervention* and *post-intervention* periods) and units (i.e., *newcomers*, *dropouts*, and *continuing*). The *pre-intervention* period is set at 2003 when there are absolutely no MOB established yet in municipalities, while 2006 and 2009 are considered as *post-intervention* periods as MOBs had been established in municipalities by then.

Based on the status of MOBs in each municipality, I classify households into a control group or *never clients* who reside in municipalities with no MOB in *pre-* and *post-intervention* periods as well as into three treatment groups according to the length of MOB presence: 1) *newcomers* or households that live in municipalities having MOBs in 2009, but not in 2006; 2) *dropouts* or households that live in municipalities having MOBs in 2006, but not in 2009; and 3) *continuing* or households that live in municipalities with MOBs both in 2006 and 2009. Of the 6,529 households surveyed, 36.33 percent (2,372 households) were classified as *continuing* households, 0.98 percent (64 households) as *dropouts*, and 2.91 percent (190 households) as *newcomers*.

3.2.3 Descriptive Statistics

Table 3.1 provides descriptive statistics on household and municipality attributes across the three waves of the survey to show a snapshot of the circumstances *before* (2003)

and *after* (2006 and 2009) the issuance of BSP Circular Nos. 273 and 505. In the first survey (2003), none of the households and municipalities had access to microfinance because no MOBs had been established. In the second (2006) and third (2009) surveys, MOBs could be seen in some municipalities. The proportion of self-employed is statistically larger in pre-MOB presence period. There is no statistically significant difference in the share of wage workers between pre- and post-MOB presence periods. Meanwhile, the average income from wage work and entrepreneurial activities is higher in post-MOB bank presence period. It is also evident that spending on medical care is higher during post-MOB presence period while expenditure on food and alcoholic beverage & tobacco is lower. Lastly, no statistically significant difference between pre- and post-MOB presence period is noted in education expenditure.

For household attributes, proportion of males, age of the household head, household's assets, and households that own a house is statistically higher while family size is lower after the establishment of MOBs. Education level of the household head is not statistically different between pre- and post-MOB presence periods. Lastly, the number of poor households and bank density in the municipalities are higher post-MOB presence while population is not statistically different between pre- and post-MOB presence periods.

3.3 Estimation Strategy

To identify the impact of MOB presence on various household activities and welfare, I employ an IPW DID-FE model to address the endogeneity problem associated with self-selection as well as sample attrition, which are common to any observational data where

treatment status may not be randomized. The decision of MOBs on where to establish their branches is never entirely random. Some MOBs choose to situate themselves in less poor municipalities and where there is better complementary infrastructure to guarantee loan repayment or profitability. In fact, in the data analysis section, I discussed that most MOBs are situated in the capital or in cities and first-class municipalities (Figure 3.1). However, some MOBs are also established in places that are unserved or underserved by financial institutions. The dataset also indicates that third- and fourth-class municipalities or relatively poor municipalities[27] too have MOBs. As stated earlier, this could be a result of the BSP allowing establishment of MOBs only in places not fully served by existing rural banks or MOBs.

In addition, the choice of whether a household avails microfinance products and services is not determined by chance. Households living in municipalities where MOBs are present may share similar socio-economic and cultural backgrounds (e.g., religion, ethnicity, or income source) but have different levels of enterprising capacity leading to different probabilities of their decision to avail microcredit. The selection bias arises because these unobservable characteristics may also affect outcomes of interest such as employment, income, and consumption. For example, households who are risk-takers (an attribute that is difficult to measure, if not impossible) have a higher tendency to self-select into microfinance

[27] Third-class municipalities are defined as those earning an average annual income of PHP 35 million (USD 0.79 million) or more but less than PHP 45 million (USD 1.01 million), while fourth-class municipalities are defined as those earning an average annual income of PHP 25 million (USD 0.56 million) or more but less than PHP 35 million (USD 0.79 million).

borrowing, but such households are also expected to have higher income and expenditures even without microcredit.

The IPW DID-FE model addresses the selection bias on the following aspects. First, the DID-FE addresses the non-random selection of municipalities and households on the basis of their observable attributes as well as time-invariant unobservable attributes (e.g., inherent ability, industriousness, or geographical landscape of the municipality, including climate and susceptibility to natural disaster) that may affect households' decision to avail microcredit and MOBs' choice of location.

Although I control selection on observable and time-invariant unobservable attributes in DID-FE, there may be other factors that may still confound the estimates. I combine DID-FE with IPW to address the remaining concerns on sample selection associated with households dropping out of the survey, which are typically observed in longitudinal observational data. Finally, I employ the methodology developed by Oster (2019) and Altonji et al. (2005) to determine whether there are still unobserved confounders in the IPW DID-FE.

3.3.1 DID-FE model

I use the event when the BSP partially lifted the moratorium on the establishment of new banks in 2001 to evaluate the impact of access to microfinance through MOB presence in municipalities. This regulatory policy led to the opening of MOBs in 2004. With this event, we can estimate the following household FE in a DID regression, which compares

households with and without MOBs in 2003 (*pre-intervention*) and in 2006 and 2009 (*post-intervention*):

$$y_{imt} = \beta_i + \delta_1(TREAT_{im}\ X\ POST_t) + \delta_2(TREAT_{im}\ X\ POST_t\ X\ dum09) + \gamma_t + \pi^* X'_{imt} + \rho^* Z'_{mt} + \varepsilon_{imt} \quad (1)$$

where y_{imt} is the measure of activities and welfare for household i residing in municipality m at time t, including: 1) real[28] household expenditure on food, medical care, alcoholic beverage & tobacco, and education; 2) household head is employed or self-employed; and 3) income from wage & salary or entrepreneurial activities. Real expenditures and income are transformed to inverse hyperbolic sine (or arcsinh)[29] to retain zero values because some households do not spend on certain goods and services or may not be earning momentarily. We are interested in evaluating the employment status of the household head as microfinance programs are intended to enhance self-employment activities. I use income and consumption as they are common indicators of poverty or wellbeing.

$TREAT_{im}$ is our treatment variable, which equals 1 for households i living in municipalities m that had at least one MOB and 0 otherwise. $TREAT_{im}$ is further classified into three broad categories: *newcomers, dropouts,* and *continuing* households. *Never clients* are the control group that includes households living in municipalities that do not have MOBs. $POST_t$ is a dummy that equals 1 for years 2006 and 2009 (*post-intervention*) and 0 for year 2003 (*pre-intervention*). $dum09$ is a dummy that equals 1 for observation year 2009. To better understand the treatment effects, I run pairwise regressions using the three

[28] The amount of expenditure is deflated by consumer price index with base year of 2012.

[29] The inverse hyperbolic sine transformation can be expressed as $arcsinh(x) = \log(\sqrt{X^2 + 1} + x)$.

classifications of the treatment groups (*newcomers*, *dropouts*, and *continuing* households) with *never clients*.

There are several potential threats to the validity of the DID-FE model. First, the location of MOBs is not random over municipalities and time as described earlier. Note that the BSP only restricted the establishment in areas not fully served by rural banks or MOBs, so we would expect that their establishment may depend on some pre-existing characteristics of their potential clients and municipality. In Table 3.2, we compare the baseline characteristics in 2003 of *newcomers*, *dropout*, and *continuing* households to *never clients*. *Newcomer* households are less likely to own a house. *Dropout* households are less likely to have a male as head of the family, but they have smaller family size compared to *never clients*. *Continuing* households are less likely to be headed by male or younger adults. In terms of municipality attributes, the municipality where *newcomers* live in has a high number of poor families. *Dropout* households are situated in municipalities that have lower population as well as number of poor families and banks. But for *continuing* households, the municipality that they reside at has large number of poor families and banks compared to *never clients*. To deal with this non-random selection of households and MOBs, I included a set of household attributes X_i' and municipal characteristics Z_m'. Household characteristics include sex, age, age squared, and education level of the household head, family size, and ownership of house and/or lot and financial assets[30]. The municipality controls are population, number of banks, and poor households that have influence on MOB's choice of location. These observed

[30] Financial assets owned comprised dividends and investments, interest from bank deposits and loans to other households, amount deposited in banks/investments, and profits from sale of stocks and real property.

controls comprised of demand-side factors for the reason they are exogenous – determined prior to the policy intervention. Supply-side factors are not considered because they are endogenous as they are mostly driven by household's choice of lender (i.e., outcome variable that also indicates level of competition and concentration in the credit market) and risk/return profile of the borrower.

Additionally, I included household fixed effects β_i to effectively account for the time-invariant unobserved household attributes. For example, entrepreneurial ability and risk preference may greatly influence a household's decision to avail microfinance products and services. According to Berg et al. (2013), less risk averse and highly skilled households are more likely to engage in productive activities such as non-farm enterprises, and households with higher entrepreneurial ability are more likely to borrow. As such, households that are risk-takers with better entrepreneurial skills are more likely to avail microfinance through MOBs. I cluster the standard errors at the municipality-year level to allow for an arbitrary covariance structure within municipality across time as the error term ε_{imt} might be correlated across households within a municipality at a specific time period.

The identification strategy is based on the common trends assumption. Note that the dataset has just one pre-MOB period in 2003, which prevents the testing (indirectly) of the parallel trends assumption using multiple pre-intervention periods. To mitigate the concern, I control for time trend γ_t that captures temporal changes in the outcome variables that are common to all households, which reduces estimation bias, if any, originating from violation of the common trends.

The coefficient δ_1 is the estimated *immediate* causal effect of MOB presence for both *dropout* and *continuing* households. δ_2 captures *persistent* effect for *dropouts* and *incremental* effect for *continuing* households. It also represents the *immediate* effect in 2009 when $TREAT_{im}$ is classified as *newcomers*. The sum of δ_1 and δ_2 pertains to *total* (or *net*) treatment effect. A summary of these classifications of effects is presented in Table 3.3.

These coefficients capture differences in the impacts depending on the length of MOB presence. For example, if access to microfinance through MOB presence has a true lasting positive effect on *continuing* households, then we should find statistically significant *total* (or *net*) positive impact of δ_1 and δ_2 as well as the corresponding *F*-statistic. But if we observe a statistically insignificant *F*-statistic, then longer access to microfinance diminishes gains or even regress. These coefficients underscore the sensitivity of the impact with respect to the length of access to microfinance, which can be very valuable in designing effective microfinance programs, products, and services.

I also determine the heterogeneous effects depending on the poverty level of the household as well as the gender of the household head. It is important to disentangle these effects as much of the literature predicts that the impacts of microfinancing may be influenced by the gender and economic class of the recipients and also because microfinance programs typically target women and poor individuals.

3.3.2 IPW DID-FE model

To obtain internally valid estimates, sample selection bias, arising out of the possibility of non-random dropping out of households from the survey across treatment and

control groups, is another concern that needs to be addressed. In the data subsection of the chapter, I discussed that the household panel dataset approximately represents 16 percent of the original sample in 2003, 2006, and 2009. It is important to account for those who drop out of the survey, especially if attrition is non-random so that the remaining sample can be representative of the original population (Barry, 2005).

I checked if there are any systematic differences in the pre-intervention (2003) demographic and other socioeconomic characteristics of households that remained in the follow-up surveys in 2006 and 2009 and were, thus, used as our study sample (*stayers*) and those who did not (*attritors*). Table 3.4 indicates that there are significant differences in the outcome variables and attributes between attritors and stayers—except in spending on alcoholic beverage & tobacco and education as well as in income from entrepreneurial activities. I also analyzed the probability of stayers regressed on treatment dummy as well as a range of respondent and household characteristics. Table 3.5 shows that the coefficient of the treatment dummy is never statistically significant. However, a test of joint significance shows that the covariates are jointly correlated with stayer status.

To deal with this potential sample selection bias, I take the DID-FE model a step further by combining it with IPW as outlined by Hirano, Imbens, and Ridder (2003). The weights are estimated by fitting a logistic model of the probability of the stayer household, which is defined as:

$$Prob(STAYERS_i = 1) = \frac{\exp(\delta X_i)}{1 + \exp\,(\delta X_i)} \qquad (2)$$

where i indexes households. The variable $STAYERS_i$ is a dummy equaling 1 for household i that is successfully interviewed until the 2006 and 2009 surveys and 0 otherwise. X_i is a vector of household characteristics such as household head's age, sex, and education level, as well as family size and house ownership from 2003 FIES that includes households who dropped out of the survey (see Table A3.1 for the results).

I then check whether the weighting by the inverse propensity score creates an appropriate control group. The means of the observable baseline characteristics are balanced after weighting by the inverse propensity scores. Results in Table A3.2 suggest that there is no significant difference in the means of the baseline characteristics between stayers and attritors once the means are weighted using the inverse propensity scores. I also perform a balancing check within the stayer sample, between never clients (control group) and the three treatment groups (i.e., continuing, dropout, and newcomer households). The results of the exercise in Table A3.3 indicate that there is no significant difference in the means of the baseline characteristics between households that live in a municipality with MOB and those that did not.

3.3.3 Selection on Unobservable Attributes

While I controlled for selection bias on the basis of observable attributes, time-invariant unobservable attributes, and households dropping out of the survey, there may be unobservable factors like time-variant attributes (e.g., dynamic learning effects and productivity of households and municipalities) that can still confound the estimates. To address this concern of endogeneity associated with self-selection on the basis of unobserved

factors, I employ the methodology developed by Oster (2019) and Altonji et al. (2005) to determine if there remain omitted variables based on unobservable characteristics. Oster's restricted estimator is used which assumes (i) equal selection ($\tilde{\delta} = 1$) or that the unobservable and observables are equally related to the treatment and (ii) the relative contributions of each observed controls to the treatment must be the same as their contribution to the outcome variable. Given this, we can calculate an approximation of the bias-adjusted treatment effect with:

$$\beta^{*\prime} = \tilde{\beta} - [\dot{\beta} - \tilde{\beta}] \frac{Rmax - \tilde{R}}{\tilde{R} - \dot{R}} \qquad (3)$$

where $\dot{\beta}$ is the coefficient resulting from the short regression of outcome variable on treatment and the R-squared from that regression as $\dot{R}$. $\tilde{\beta}$ is the coefficient from the intermediate regression of outcome variable on treatment and observed controls and the R-squared as $\widetilde{R}$. Finally, Rmax is the hypothetical R-squared from a regression of outcome variable on treatment, observed controls and not observed. In this study, $R_{max} = \min\{1.3\widetilde{R}, 1\}$. Oster (2019) explains that "$1.3\widetilde{R}$ is a cut-off value derived from a sample of 76 results from randomized 27 articles from top journals which allow at least 90.0 percent of the results would remain robust against unobservable selection bias".

I then estimate a set of bounds for β based on Oster's restricted estimator to conduct the robustness test. One bound is $\tilde{\beta}$ (corresponding to those in IPW DID-FE with all observable controls included); the other bound is a restricted bias-adjusted coefficient $\beta^{*\prime}$, which is the value of β when $R^2 = R_{max} = \min\{1.3\tilde{R}, 1\}$ and $\tilde{\delta} = 1$. With these two bounding assumptions, we can define a bounding set as $[\tilde{\beta}, \beta^{*\prime}(\min\{1.3\tilde{R}, 1\})]$. If this set

excludes 0, the results from the controlled regression can be considered robust to omitted variable bias. Additionally, when the bounding set (or identified set) is within the confidence intervals of the controlled effect $\tilde{\beta}$, it implies that the omitted variables are unlikely to drive the results.

Meanwhile, Altonji et al. (2005) suggested a ratio of the impact of unobserved variables relative to the observed explanatory variables that would be needed to fully explain the treatment effect of MOB presence on some household welfare outcome measures. We denote this ratio by δ^0. A hypothetical $\delta^0 > 1$ suggests that the treatment effect can be considered robust to unobserved confounders and that the unobservables would have to be δ^0 times strongly correlated than observables for the unobservables to explain the treatment effects.[31]

3.4 Results and Discussions

I present results from IPW DID-FE specification in Tables 3.6 to 3.8 where the estimated coefficients for income and real expenditures have been transformed [32] to elasticities in percentage change for arcsinh-linear specification with dummy independent variables.

[31] Khan, Nakano, and Kurosaki (2019) interpret $\delta < 0$ as the coefficient increasing in magnitude due to the controls. And that while this does not indicate that the coefficient is unstable, it suggests that the method is not informative regarding omitted variable bias.

[32] See Bellemaret and Wichman (2020) for the derivation of elasticity. The non-transformed treatment effects are reported in Tables 3.9 to 3.11.

3.4.1 Average Effects of MOB Presence

Panel A of Table 3.6 shows that there is no evidence of positive impact on consumption for *continuing* households. Nonetheless, we see *immediate* gains of 2.80 percentage points on the likelihood of self-employment and of 0.44 percent on entrepreneurial income in 2006 are noted. These are, however, muted by *incremental* reduction of 4.30 percentage points in the probability of self-employment and of 0.31 percent in entrepreneurial income in 2009. The *net* impact on self-employment is statistically not different from zero according to joint *F*-tests shown in Panel A of Table 3.6. This is probably because the typical businesses set up by microfinance clients in the Philippines are susceptible to closure because they are mostly small-scale production or distribution of goods and services (e.g., sari-sari store or small grocery/convenience store, ambulant/rolling stores, hair dressing, barbering, tailoring, tire repair, etc.)[33], which generates low, seasonal, or irregular income and faces stiff competition with big or organized establishments that offer comparable and lower-priced products and services (Milgram, 2005).[34]

Dropouts in Panel B of Table 3.6 indicate that they enjoy a *persistent* increase in spending on education of 0.96 percent in 2009 after the MOB ceases operating. A statistically significant joint *F*-test on education spending can also be observed, indicating that *dropouts* enjoy a *total* positive effect of 1.55 (i.e., 0.59 + 0.96) percent. A *total* positive effect of 3.11 percent is also noted on medical care spending as the corresponding *F*-statistic is statistically

[33] Karlan and Zinman (n.d.) contends that these are the usual clients of microfinance providers in the Philippines, such as First Macro Bank.

[34] I also conducted an exercise evaluating the variations in measures of household welfare induced by differences in the intensity of MOB presence in municipalities. The marginal effects of increased intensity are negligible.

significant. These outcomes suggest that among *dropouts,* MOB presence has some benefits even beyond the years during which households no longer have access to microfinance. However, a negative effect is observed in 2009 on the likelihood of and income from wage work of 15.90 percentage points and 0.65 percent change, respectively, with no significant effect on self-employment activities. The *persistent* negative effect in 2009 on wage work reflects the general conclusions of Karlan and Zinman (2011) in the Philippines. They found that 11 to 22 months (i.e., in the short-term) after a business owner is placed in a pool of marginally creditworthy loan applicants (regardless of whether they actually receive a loan), the scale of their business shrank and employed paid workers decreased.

As for *newcomers,* they do not enjoy any *immediate* benefits from presence of MOB in their municipalities in 2009 (Panel C of Table 3.6). Somewhat unexpectedly, however, a significantly positive impact on self-employment activities in 2006 is noted even if they did not have access to microfinance. This is presumably because of the presence of self-selection which I will examine later (Section 3.5: Test on Omitted Variables) in this chapter.

3.4.2 Heterogeneous Effects of MOB Presence

I now turn to the heterogeneous effects of MOB presence on poverty level of the household as well as on gender differences. A household is considered poor if it is categorized under the first to third regional income decile. The PSA groups families into two income strata, the Bottom 30% and the Upper 70%. The Bottom 30% grouping is used as a proxy for those falling below the poverty line. It refers to the lowest 30 percent of the total households in the per capita income distribution, arranged in descending order.

I assess whether the establishment of MOBs reduces poverty, as claimed by the proponents of MOBs under the impression that the poor are just financially constrained but can otherwise have high return to investment (Kaboski & Townsend, 2012). Meanwhile, effects of gender difference are also explored, not only because microfinance providers typically target women, but also because many microfinance programs aim to affect women empowerment. Women are often targeted under the belief that they have less access to credit and lower outside options in the labor market, but have highest returns to private entrepreneurship (Kaboski & Townsend, 2012). Moreover, providing economic options to women allows them to gain control over financial resources which could improve not only their physical and mental health but also their family's well-being (Angelucci et al., 2015; Duvendack & Mader, 2020).

3.4.2.1 Bottom 30% Income Households

In Panel A of Table 3.7, it can be noted that there is no significant effect on consumption of *continuing* households. They nonetheless enjoy an *immediate* increase in 2006 in the likelihood of being self-employed and in entrepreneurial income of 13.2 percentage points and 1.69 percent, respectively. A *net* positive effect on self-employment activities of 9.30 percentage points is likewise noted given the statistically significant joint *F*-test. However, an *immediate* decrease in the probability of wage work of 9.5 percentage points in 2006 and *incremental* reduction in wage income of 0.49 percent in 2009 are also noted. The joint *F*-test on the probability of engaging in wage work indicates a negative *net* impact of 6.50 percentage points. Crèpon et al. (2015) suggest that this outcome is not

unusual as the lesser preference for wage work is a byproduct of higher income from self-employment activities because households in this scenario have strong disutility with casual (day) labor or stable salaried work. That is, there is a change in household activity towards self-employment and away from wage work. Banerjee, Karlan, et al. (2015) further explained that microcredit affords the poor more freedom in their choice of occupation.

Poor *dropouts* in Panel B of Table 3.7 displayed *immediate* increased spending on medical care of 1.29 percent in 2006 but this is coupled by decreased education expenditure of 0.47 percent and wage income of 0.73 percent. Subsequently, relative to 2006, results show that while education expenditure of poor *dropouts* increased by 1.19 percent in the year beyond which there were no MOBs in municipalities (i.e., 2009), income from entrepreneurial activities and food expenditures decreased by 0.67 and 0.07 percent, respectively. Joint *F*-test on self-employment income further indicates significant *total* negative effect of 0.84 percent. The reduced spending on education in 2006 implies that households possibly sacrifice their consumption on some goods and services in the short run as microfinance loans might not be large enough to fully cover the costs of establishing a business or even the borrowing cost (Augsburg et al., 2012; Banerjee, Duflo, et al., 2015; Karlan & Zinman, 2010). Another possible reason of the reduced spending on education is the labor demand effect of access to credit. If access to microfinance leads to investment in a household enterprise, and employing family members raises household productivity, then the opportunity cost of sending family members to school is high. The same is also true when parents need to increase their working hours, because of which attending to household chores becomes necessary for children (Hazarika & Sarangi, 2008). Hence, it is likely that when

households no longer have access to microfinance, their economic activities diminish, and the demand for labor is thereby reduced. This may also explain why education spending increased in 2009. It is, however, worrying that in the case of the Philippines, expenditure on education is most likely to be temporarily compromised by the poor. Meanwhile, we find an immediate decrease in wage income which Crèpon et al. (2015) explain may be due to households taking advantage of the opportunities of having access to microcredit by doing less labor-intensive second job (e.g., manually washing clothes for a family) and increasing their leisure time. Another plausible explanation is provided by Milgram (2005) wherein entrepreneurs in the Philippines are reluctant to increase salaries or promise a regular work, as prices of goods and services they sell fluctuate often. Lastly, the persistent negative effects on entrepreneurial income and food spending reflect the detrimental consequences of short-lived access to microfinance among poor households.

As for the effect on poor *newcomers* in Panel C of Table 3.7, wage income of poor *newcomers* decreased *immediately* by 0.57 percent in 2009 relative to 2006, although the joint *F*-test shows statistically insignificant net impacts (Panel C or Table 3.7). Like dropouts, reduced wage income may be due to households investing in less labor-intensive occupations, building up assets, or even increasing their leisure-time in the first year of access to microfinance (Crèpon et al., 2015). Meanwhile, the significant negative effect on food expenditures in 2006 may indicate potential presence of self-selection.

I extended our analysis on the potential impact on the Upper 70% income or non-poor households to examine if MOB presence is more beneficial to this segment of the population. Results in Table A3.4 show that non-poor households gain more from access to microfinance.

While no impact on the welfare of *continuing* non-poor households is recorded, *newcomers* experienced a *total* positive effect of 2.23 percent on entrepreneurial income (joint *F*-tests are statistically significant). Among *dropouts*, although they registered negative *net* impact of 17.90 percentage points on the probability of being wage workers and *total* negative impact of 1.03 percent on wage income, *total* positive effect on medical care of 3.23 percent and on education spending of 1.70 percent (joint *F*-tests are statistically significant) as well as *persistent* positive effect on the likelihood of being self-employed of 20.4 percentage points are observed in 2009. These results affirm the study of Kondo et al. (2008) in the Philippines that the impact of microfinance is positive for richer households. Among poorer borrowers, the cost and availability of microfinance products and services are not large enough for them to start a business that could have high returns.

3.4.2.2 Female-Headed Households

Panel A of Table 3.8 shows that longer presence of MOB in municipalities has minimal effect on female-headed households. *Continuing* households only enjoyed *incremental* increase in education spending of 0.50 percent in 2009 with no overall total (joint *F*-test is statistically insignificant) effects. In 2006, the likelihood of wage work reduced *immediately* by 6.0 percentage points.

Panel B of Table 3.8 shows that *dropout* female-headed households enjoyed a *net* increase of 6.40 percent in spending on medical care as well as *total* positive effects on temptation goods (i.e., alcoholic beverage & tobacco) and education of 1.41 percent and 1.49 percent, respectively, as their corresponding joint *F*-test show statistically significant impacts.

Their probability of becoming self-employed also increased *immediately* by 26.0 percentage points in 2006. However, a diminishing, negative effect on income from entrepreneurial activities of 0.81 percent was observed in 2009. These results may indicate that *dropout* female-headed households, when access to microfinance is short-lived, are likely to reallocate their loans to facilitate consumption spending. Milgram (2005), in her study on women participation in microfinance programs in the Philippines, finds that while the profit women earned from entrepreneurial activities augments their household income, it is mostly spent on either meeting their basic day-to-day consumption or to help cover the costs of their family's healthcare and education expenses.

Meanwhile, *newcomers* registered *net* positive impact of 15.0 percentage points on the probability of being self-employed due to MOB presence (Panel C of Table 3.8). This result, however, may be difficult to interpret or perhaps indicative of self-selection bias as the recorded positive effect on the likelihood of self-employment is noted in 2006 when no MOB has been established. There are also observed detrimental effects on medical care spending in 2006 which may also suggest self-selection bias.

The observed increased spending on non-food goods and services of both *dropout* and *continuing* households highlights the contention that providing women access to microfinance could improve not only their physical and mental health but also their family's well-being.

As for male-headed households, the overall impact of access to microfinance through MOB is benign (Table A3.5). While *dropouts* enjoyed *total* positive effects of 2.20 percent on their medical care expenditure and 1.45 percent on education spending as well as

persistent increase in the likelihood of engaging in entrepreneurial activities of 5.30 percentage points, their wage income declined by 0.64 percent. Longer presence of MOB led to *incremental* decrease in the likelihood of and income from self-employment of 4.40 percentage points and 0.34 percent, respectively. This indicates that products and services of MOBs are tailored for female clients.

Overall, *newcomers* generally do not experience any *immediate* gains from MOB presence. MOB presence translates to consumption smoothing, but not so much to income-generating self-employment activities among *dropouts*. *Continuing* households enjoy increased engagement in and income from entrepreneurial activities, but these gains do not accrue indefinitely. There is seemingly a diminishing or even regressive impact when households access microfinance through MOBs for a longer period. The potential gains for poor households are increased expenditure on medical care and education as well as the opportunity to be self-employed. However, the results likewise suggest that they momentarily reduce expenditure on education when MOB presence is temporary. Female-headed households enjoy *persistent* increase in non-food expenditure, beyond the years during which MOBs still operate. And if MOBs operate longer, the effect persists to increase education spending.

3.5 Tests on Omitted Variables

It can be observed in the results for *newcomers* in Tables 3.6 to 3.8 that few outcome variables registered significant estimates in 2006, the year when there were still some municipalities without MOB. This may imply presence of self-selection, perhaps because the

reweighted data used observed but not unobserved characteristics, such that the estimation procedure did not fully address the concern of potential endogeneity resulting from omitted variables. I deem, however, that these will not pose serious threat on the validity of our results. There is only one outcome variable out of ten that displayed significant coefficients such as: 1) average positive effect of 7.60 percentage points on the likelihood of self-employment among *newcomers* in 2006; and 2) reduced food spending of 0.11 percent by poor *newcomers* in 2006. Meanwhile, there are two outcome variables that registered statistically significant effects on *newcomer* female-headed households, namely, increased likelihood of self-employment of 26.7 percentage points and reduced medical care spending of 0.38 percent.

I nonetheless investigate the robustness of our estimated coefficients to other unobserved factors that might contribute to the non-random selection of our households into our treatment group and MOB location using the Oster (2019) and Altonji et al. (2005) approaches. The estimated coefficients for income and consumption expenditures shown in Tables 3.9 to 3.11 are not the elasticities or percent change but for the arcsinh transformation. Overall, the value of several δ^0 and/or the coefficient bounds point to robustness in all our statistically significant estimates.

For instance, the coefficient bound interval (0.67, 0.66) for the effect of MOB presence on education spending of *dropouts* in Panel B of Table 3.9 does not contain 0 and is within the confidence interval of the controlled effect, which implies that the estimate is robust. Similarly, the value of $\delta_2^0 = 60.62$ indicates that unobservables must be 60.62 times as important as the control variables to drive the treatment effect to 0. Since this value is greater than 1, the effect can be considered robust to selection on unobservables. Regarding

the other estimates that either have bound intervals containing 0, are not within the confidence interval, or have $\delta^0 < 1$, I still do not consider these a major enough concern for our results to be claimed false positive as they are insignificant coefficients.

3.6 Conclusion

This study utilizes a nationally representative panel dataset drawn from the 2003, 2006, and 2009 FIES for the Philippines to analyze whether access to microfinance through establishment of MOBs in municipalities affects various measures of household welfare such as engagement in wage work and self-employment activities, wage and entrepreneurial income, and consumption on food, medical care, alcoholic beverage & tobacco, and education.

Deviating from the previous literature, this study examines not only the sensitivity of the impact to the length (i.e., *short- and long-term*) of MOB presence in a municipality but also the differentiation of the impact into *immediate, incremental, persistent,* or *total* effects. Furthermore, heterogenous effects by poverty level and gender are also examined. I employ DID-FE and IPW to control for endogeneity problem associated with self-selection as well as sample attrition.

Results suggest heterogenous effects of MOB presence in terms of length. When access to microfinance through MOBs is short-term, households generally use microfinance funds for consumption smoothing and not so much for income-generating self-employment activities. Contrarily, longer presence of MOB increases households' engagement in and income from entrepreneurial activities. However, these benefits diminish or even regress

over time. I also find heterogeneity in terms of the poverty level of the household and gender of the household head: non-poor households benefit more than poor households, and female-headed households gain more than male-headed ones.

These findings show that the benefits of using microfinance products and services are not evenly distributed among all households, which prompts a rethinking of the role of microfinance in basic development outcomes for poor or female-headed households. For those who have access to microfinance through MOBs, while it raises the likelihood of households being microentrepreneurs, it does not fuel an escape from poverty. Consumption does not increase for those who live in municipalities with long-term MOB presence; neither does it increase indeterminately as observed in educational expenditure of female-headed households. Similarly, income does not increase in the long run. MOB presence in the short run also seems to encourage consumption spending rather than engagement in income generating self-employment activities. Finally, although women benefit more from MOB presence, the effect is larger for non-poor households, which casts doubts on the effectiveness of MOB targeting policies.

As such, access to microfinance through MOBs may not be as "transformative" as its proponents claim it to be. However, by providing opportunities to open or expand existing microbusinesses, it reduces vulnerability of clients, who would otherwise have been wage workers had not they received it. Microfinance also provides the clients with the ability to invest in human capital (i.e., education and health). That is, it affords households to make intertemporal choices, including the freedom to choose which income-generating activities to undertake.

Table 3.1: Summary Statistics

	Pre-MOB Presence		Post-MOB Presence				Difference (Pre-MOB vs Post-MOB)
	2003		2006		2009		
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	t-statistics
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Outcome Variables							
Employment Status							
Employed	0.36	0.48	0.34	0.48	0.36	0.48	1.52
Self-employed	0.50	0.50	0.50	0.50	0.46	0.50	2.90***
Household Income							
Wage and Salaries	56,369.59 (USD1,039.97)	94,018.38	63,205.71 (USD1,231.74)	111,780.3	75,177.68 (USD1,578.13)	118,238.00	-8.33***
Entrepreneurial Activities	35,246.49 (USD650.26)	70,653.33	42,228.30 (USD822.93)	89,198.04	42,228.30 (USD886.46)	48,297.92	-7.81***
Real Household Expenditures (2012=100)							
Food	828.43	517.22	799.922	514.13	780.75	458.45	4.95***
Medical Care	34.16	117.09	50.55	237.09	59.25	289.97	-7.59***
Alcoholic Beverage & Tobacco	33.28	41.43	30.26	40.58	30.13	36.72	5.02***
Education	77.15	230.67	83.28	250.88	76.31	213.59	-0.75
Household Attributes							
Household Head Sex (1=male; 2=female)	1.15	0.35	1.17	0.37	1.19	0.40	-6.15***
Household Head Age	47.50	13.83	50.01	13.48	52.18	13.38	-17.29***
Household Head Education	7.58	16.89	7.76	17.15	7.98	17.44	-1.11
Family Size	5.07	2.15	5.01	2.20	4.86	2.19	4.21***
Amount of financial assets owned	5,148.51 (USD94.99)	33,505.34	6,619.99 (USD129.01)	74,965.86	8,479.13 (USD177.99)	61,808.68	-3.29***
House and/or land ownership (1=yes; 0=no)	0.74	0.44	0.78	0.41	0.77	0.42	-4.75***
Municipality Attributes							
Population	190,209.10	390,665.60	193,823.10	398,088.20	197,505.70	405,651.90	-0.91
Number of poor families	55,856.50	41,826.13	63,818.40	46,868.97	66,878.94	45,808.56	-14.43***
No. of banks	143.03	195.50	151.09	203.91	164.24	213.68	-4.83***
Observation				6,529			

Notes: MOB = microfinance-oriented banks. The numbers in the table are rounded-off to the nearest two decimal places. Financial assets owned comprised of dividends and investments, interest from bank deposits and loans to other households, amount deposited in banks/investments, and profits from sale of stocks and real property. Employed refers to those working for private household, private establishment, and government while self-employment comprised of self-employed without any employee and employer in own family-operated farm or business. The peso-dollar exchange rate used for the pre-MOB presence is the average for 2003 at PHP 54.20 and for the post-MOB presence is the average for 2006 at PHP 51.31 and in 2009 at PHP 47.64, posted by the BSP in its website.

Table 3.2: Pre-MOB Presence Comparison of Household Characteristics

	Never Clients (1)	Difference (Never Clients vs Newcomer) (2)	Difference (Never Clients vs Dropout) (3)	Difference (Never Clients vs Continuing) (4)
Outcome Variables				
Employment Status				
Employed	0.35	-0.20***	0.08	-0.03
Self-employed	0.53	0.22***	-0.02	0.05***
Household Income				
Wage and Salaries	55,135.34	11,190.74*	-7,953.44	-4,079.11
Entrepreneurial Activities	36,781.61	16,926.77***	15,839.94***	2,442.24
Real Household Expenditures (2012=100)				
Food	827.64	119.95*	-91.68	-9.33
Medical Care	33.90	6.39	14.29*	-1.61
Alcoholic Beverage & Tobacco	32.82	-9.94*	-5.06	-0.33
Education	78.03	24.78	25.96**	-0.28
Household Attributes				
Household Head Sex (1=male; 2=female)	1.14	-0.03	-0.14*	-0.02*
Household Head Age	46.97	-1.79	-3.97	-1.22***
Household Head Education	7.53	-0.04	-5.78	0.02
Family Size	5.10	0.47	2.61*	0.59
Amount of financial assets owned	4,731.58	-34.34	2,147.21	-1,202.77
House and/or land ownership (1=yes; 0=no)	0.75	0.34***	-0.13	-0.01
Municipality Attributes				
Population	217,966.9	53,297.36	191,756***	66,961.17
Number of poor families	45,816.10	-66,695.90***	21,089.10***	-22,863.08***
No. of banks	123.71	23.29	74.71***	-53.34*

Notes: MOB = microfinance-oriented banks. Column (1) reports group mean for each variable of those households that live in a municipality without MOBs (or "never clients"). The *t*-test for differences in the means with standard errors clustered at the municipal level of households that live in a municipality with MOBs only in 2009 (or "newcomer") are reported in Column (2), those with MOBs only in 2006 (or "dropouts") in Column (3), and those with MOBs both in 2006 and 2009 (or "continuing") in Column (4). The Philippines has four levels of administrative divisions – regions, provinces, cities and municipalities, and barangays – the highest level is regions and lowest is barangays. The numbers in the table are rounded-off to the nearest two decimal places. Household income and financial assets owned are in Philippine peso. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 3.3: Duration of Effects: By Treatment Group

Treatment Group	Duration		
	2006	**2009**	**2006 + 2009**
Continuing	Immediate	Incremental	Total (or Net)
Dropout	Immediate	Persistent	Total (or Net)
Newcomer		Immediate	Total (or Net)

Table 3.4: Stayers versus Attritors

		Stayers group			Stayers - Attritors	
	Obs	**Obs**	**Mean**	**Standard Deviation**	**Difference**	***p*-value**
Outcome Variables						
Real Household Expenditures (2012=100)						
Food	42,094	6,529	828.53	517.29	-11.84*	0.09
Medical	42,094	6,529	34.16	117.09	-3.91**	0.03
Alcoholic Beverage & Tobacco	42,094	6,529	33.27	41.43	0.41	0.47
Education	42,094	6,529	77.11	230.66	-0.94	0.77
Employment Status						
Employed	42,094	6,529	0.36	0.48	-0.04***	0.00
Self-employed	42,094	6,529	0.50	0.50	0.04***	0.00
Household Income						
Wage and Salaries	42,094	6,529	56,372.69	94,018.08	-4,205.26***	0.00
Entrepreneurial Activities	42,094	6,529	35,259.15	70,661.03	32.14	0.99
Household Attributes						
Household Head Sex (1=male; 2=female)	42,094	6,529	1.15	0.35	-0.02***	0.00
Household Head Age	42,094	6,529	47.51	13.83	1.46***	0.00
Household Head Education	42,094	6,529	7.58	16.89	-1.03***	0.00
Family Size	42,094	6,529	5.07	2.15	0.28***	0.00
Financial assets owned	42,094	6,529	5,148.51	33,505.34	-2,178.34***	0.01
House and/or land ownership (1=yes, 0=no)	42,094	6,529	0.74	0.44	0.06***	0.00

Notes: Data source is 2003 FIES. Sample includes all households surveyed in 2003. The numbers in the table are rounded-off to the nearest two decimal places. Household income and expenditures as well as financial assets owned are in Philippine peso. Stayers are the households that were surveyed in 2006 and 2009. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 3.5: Probability of Household Stayed Until 2009 FIES

	Dependent Variable: HH stayers between 2003 and 2009				
	(1)	(2)	(3)	(4)	(5)
MOB presence	0.060	0.072	0.078	0.082	0.075
	(0.232)	(0.238)	(0.235)	(0.232)	(0.244)
Household attributes	No	Yes	Yes	Yes	Yes
Household expenditures	No	No	Yes	Yes	Yes
Employment status	No	No	No	Yes	Yes
No. of banks	No	No	No	No	Yes
Observations	42,094	42,094	42,094	42,094	42,094
***F*-stat (test of joint significance) - including treatment**		39.86	44.80	65.02	71.49
Prob>*F*		0.00	0.00	0.00	0.00
***F*-stat (test of joint significance) - excluding treatment**		25.00	29.59	31.54	38.19
Prob>*F*		0.00	0.00	0.00	0.00

Notes: HH = Household. Data source is 2003 FIES. Sample includes all households surveyed in 2003. The numbers in the table are rounded-off to the nearest two or three decimal places. Coefficients and standard errors (in parentheses) clustered at the municipal level are from a probit regression where the dependent variable is an indicator of whether the household stayed or not. Household attributes are sex, age and education of the household head, financial assets owned, and house ownership. Household expenditures comprise of food, medical care, alcoholic beverage & tobacco, and education. Employment status refers to wage worker or self-employed. The standard errors are also corrected by propensity score-matched. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 3.6: Average Effects of Microfinance-Oriented Bank Presence: IPW DID-FE

	Employment Status		Income		Real Expenditure			
	Employed	**Self-employed**	**Wage & Salaries**	**Entrepreneurial Activities**	**Food**	**Medical Care**	**Alcoholic Beverage & Tobacco**	**Education**
Panel A: Treatment Group: Continuing Clients (With MOB in 2006 and 2009)								
Control Group: Never Clients (No MOB)								
CONTINUING x POST	-0.016	0.028*	0.079	0.444*	0.022	0.059	-0.069	0.002
	[-0.047, 0.014]	[-0.005, 0.061]	[-0.362, 0.520]	[-0.046, 0.933]	[-0.026, 0.069]	[-0.134, 0.253]	[-0.224, 0.086]	[-0.159, 0.162]
CONTINUING x POST x 2009	0.024	-0.043***	-0.015	-0.314**	-0.005	-0.001	-0.007	-0.034
	[-0.008, 0.055]	[-0.075, -0.011]	[-0.406, 0.376]	[-0.583, -0.046]	[-0.046, 0.037]	[-0.209, 0.206]	[-0.179, 0.166]	[-0.171, 0.103]
F-stat (test of joint significance)	0.16	0.68	0.11	0.00	0.48	0.31	0.73	0.13
R-squared	0.026	0.016	0.045	0.019	0.262	0.028	0.039	0.082
No. of Observations	18,825	18,825	18,825	18,825	18,825	18,825	18,825	18,825
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Treatment Group: Dropout Clients (With MOB in 2006)								
Control Group: Never Clients (No MOB)								
DROPOUT x POST	0.066	0.033	-0.028	0.351	0.046	2.693	0.144	0.590
	[-0.019, 0.150]	[-0.095, 0.161]	[-1.892, 1.836]	[-0.640, 1.343]	[-0.336, 0.429]	[-1.662, 7.047]	[-0.864, 1.153]	[-0.468, 1.649]
DROPOUT x POST x 2009	-0.159**	0.128	-0.654***	-0.183	-0.065	0.418	-0.277	0.956**
	[-0.297, -0.022]	[-0.033, 0.290]	[-1.076, -0.232]	[-1.324, 0.959]	[-0.215, 0.085]	[-0.144, 0.981]	[-0.618, 0.063]	[0.085, 1.826]
F-stat (test of joint significance)	2.24	1.40	1.10	0.03	0.04	8.44***	0.54	11.78***
R-squared	0.025	0.016	0.038	0.022	0.248	0.037	0.042	0.084
No. of Observations	11,901	11,901	11,901	11,901	11,901	11,901	11,901	11,901
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Treatment Group: Newcomer Clients (With MOB in 2009)								
Control Group: Never Clients (No MOB)								
NEWCOMER x POST	-0.033	0.076*	0.025	1.184	-0.044	-0.083	-0.032	0.055
	[-0.129, 0.063]	[-0.006, 0.157]	[-0.810, 0.861]	[-0.870, 3.238]	[-0.106, 0.018]	[-0.368, 0.201]	[-0.345, 0.281]	[-0.341, 0.450]
NEWCOMER x POST x 2009	-0.004	-0.051	-0.079	0.033	0.050	0.227	-0.061	0.057
	[-0.111, 0.103]	[-0.127, 0.025]	[-0.946, 0.787]	[-1.164, 1.230]	[-0.054, 0.154]	[-0.271, 0.726]	[-0.278, 0.157]	[-0.159, 0.274]
F-stat (test of joint significance)	0.56	0.39	0.01	2.29	0.00	0.20	0.59	0.31
R-squared	0.026	0.015	0.037	0.020	0.251	0.028	0.042	0.081
No. of Observations	12,279	12,279	12,279	12,279	12,279	12,279	12,279	12,279
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: MOB = Microfinance-Oriented Bank. DID-FE refers to difference-in-differences fixed effects. Treatment is defined as presence of MOBs in the municipality where the household is residing. Household expenditures are deflated by consumer price indices of the goods and services with base year of 2012. Weight is from logit model where the dependent variable is an indicator of whether the household stayed or not and the control variables are household head's age, sex, education, and family size as well as house ownership. The sample used to compute the weight includes households that dropped from the survey. Estimated coefficients for income and consumption are elasticities for the arcsinh-linear specification with dummy independent variables or in percentage change in the outcome variable due to the discrete change in treatment dummy = 0 to dummy = 1. The estimated coefficients for income and consumption expenditures that are not transformed into percentage change is available upon request from the author. Confidence intervals are in brackets. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 3.7: Heterogeneous Effects of Microfinance-Oriented Bank Presence on Bottom 30% Income Households: IPW DID-FE

	Employment Status		Income		Real Expenditure			
	Employed	**Self-employed**	**Wage & Salaries**	**Entrepreneurial Activities**	**Food**	**Medical Care**	**Alcoholic Beverage & Tobacco**	**Education**
Panel A: Treatment Group: Continuing Clients (With MOB in 2006 and 2009)								
Control Group: Never Clients (No MOB)								
CONTINUING x POST	-0.095***	0.132***	0.293	1.688*	0.044	0.102	0.122	0.048
	[-0.163, -0.027]	[0.064, 0.200]	[-0.740, 1.325]	[-0.188, 3.564]	[-0.065, 0.154]	[-0.202, 0.406]	[-0.210, 0.453]	[-0.191, 0.287]
CONTINUING x POST x 2009	0.030	-0.039	-0.493**	-0.323	0.015	0.076	-0.041	0.021
	[-0.037, 0.097]	[-0.111, 0.033]	[-0.954, -0.032]	[-0.797, 0.151]	[-0.053, 0.082]	[-0.284, 0.435]	[-0.343, 0.262]	[-0.232, 0.274]
F-stat (test of joint significance)	3.24*	5.71**	0.93	2.40	1.71	1.04	0.18	0.25
R-squared	0.027	0.039	0.032	0.043	0.238	0.030	0.039	0.132
No. of Observations	5,439	5,439	5,439	5,439	5,439	5,439	5,439	5,439
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Treatment Group: Dropout Clients (With MOB in 2006)								
Control Group: Never Clients (No MOB)								
DROPOUT x POST	0.112	0.018	-0.729**	-0.079	0.034	1.293***	-0.409	-0.466***
	[-0.055, 0.279]	[-0.123, 0.158]	[-1.391, -0.066]	[-0.986, 0.827]	[-0.131, 0.198]	[0.601, 1.986]	[-1.081, 0.263]	[-0.814, -0.119]
DROPOUT x POST x 2009	-0.103	0.012	15.824	-0.673***	-0.073**	-0.138	0.357	1.189***
	[-0.406, 0.201]	[-0.045, 0.069]	[-16.341, 47.968]	[-1.081, -0.264]	[-0.139, -0.007]	[-0.684, 0.408]	[-0.427, 1.141]	[0.405, 1.973]
F-stat (test of joint significance)	0.00	0.15	0.87	13.81***	0.43	2.64	0.07	0.25
R-squared	0.038	0.050	0.035	0.061	0.243	0.031	0.039	0.147
No. of Observations	3,307	3,307	3,307	3,307	3,307	3,307	3,307	3,307
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Treatment Group: Newcomer Clients (With MOB in 2009)								
Control Group: Never Clients (No MOB)								
NEWCOMER x POST	-0.076	0.069	0.227	0.484	-0.108**	-0.234	-0.015	0.067
	[-0.340, 0.189]	[-0.154, 0.292]	[-1.498, 1.953]	[-1.993, 2.961]	[-0.201, -0.015]	[-0.559, 0.090]	[-0.475, 0.445]	[-0.320, 0.454]
NEWCOMER x POST x 2009	0.011	-0.120	-0.570**	-0.586	0.071	0.066	-0.195	-0.108
	[-0.181, 0.203]	[-0.294, 0.054]	[-1.061, -0.079]	[-1.319, 0.147]	[-0.038, 0.180]	[-0.489, 0.621]	[-0.438, 0.049]	[-0.314, 0.097]
F-stat (test of joint significance)	0.23	0.29	0.62	0.26	0.48	0.49	0.98	0.06
R-squared	0.043	0.054	0.033	0.059	0.242	0.031	0.040	0.148
No. of Observations	3,454	3,454	3,454	3,454	3,454	3,454	3,454	3,454
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: MOB = Microfinance-Oriented Bank. DID-FE refers to difference-in-differences fixed effects. Treatment is defined as presence of MOBs in the municipality where the poor household is residing. Household expenditures are deflated by consumer price indices of the goods and services with base year of 2012. Weight is from logit model where the dependent variable is an indicator of whether the household stayed or not and the control variables are household head's age, sex, education, and family size as well as house ownership. The sample used to compute the weight includes households that dropped from the survey. Estimated coefficients for income and consumption are elasticities for the arcsinh-linear specification with dummy independent variables or in percentage change in the outcome variable due to the discrete change in treatment dummy = 0 to dummy = 1. The estimated coefficients for income and consumption expenditures that are not transformed into percentage change is available upon request from the author. Confidence intervals are in brackets. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 3.8: Heterogeneous Effects of Microfinance-Oriented Bank Presence on Female-Headed Households: IPW DID-FE

	Employment Status		Income		Real Expenditure			
	Employed	**Self-employed**	**Wage & Salaries**	**Entrepreneurial Activities**	**Food**	**Medical Care**	**Alcoholic Beverage & Tobacco**	**Education**
Panel A: Treatment Group: Continuing Clients (With MOB in 2006 and 2009)								
Control Group: Never Clients (No MOB)								
CONTINUING x POST	-0.060*	0.076	-0.301	2.150	-0.050	0.079	-0.258	-0.110
	[-0.129, 0.008]	[-0.022, 0.174]	[-0.993, 0.390]	[-0.906, 5.207]	[-0.132, 0.031]	[-0.340, 0.498]	[-0.538, 0.023]	[-0.554, 0.334]
CONTINUING x POST x 2009	0.053	-0.050	0.056	-0.172	0.033	0.013	0.141	0.495*
	[-0.020, 0.125]	[-0.154, 0.055]	[-0.957, 1.069]	[-1.285, 0.940]	[-0.039, 0.104]	[-0.427, 0.453]	[-0.262, 0.545]	[-0.054, 1.045]
F-stat (test of joint significance)	0.03	0.26	0.41	1.77	0.22	0.17	0.55	1.43
R-squared	0.035	0.056	0.086	0.051	0.366	0.048	0.080	0.076
No. of Observations	3,134	3,134	3,134	3,134	3,134	3,134	3,134	3,134
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Treatment Group: Dropout Clients (With MOB in 2006)								
Control Group: Never Clients (No MOB)								
DROPOUT x POST	0.024	0.260*	-0.738	2.155	0.114	6.144**	1.389**	0.366
	[-0.060, 0.108]	[-0.040, 0.561]	[-1.664, 0.187]	[-1.683, 5.992]	[-0.408, 0.637]	[1.079, 11.210]	[0.161, 2.618]	[-0.853, 1.584]
DROPOUT x POST x 2009	-0.024	-0.041	7.082	-0.809***	0.018	0.254	0.023	1.122
	[-0.177, 0.130]	[-0.203, 0.120]	[-29.927, 44.091]	[-1.350, -0.268]	[-0.121, 0.158]	[-0.366, 0.875]	[-1.011, 1.057]	[-2.909, 5.153]
F-stat (test of joint significance)	0.00	1.09	1.15	0.15	0.47	82.26***	3.42*	3.13*
R-squared	0.053	0.060	0.065	0.064	0.317	0.059	0.077	0.091
No. of Observations	1,939	1,939	1,939	1,939	1,939	1,939	1,939	1,939
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Treatment Group: Newcomer Clients (With MOB in 2009)								
Control Group: Never Clients (No MOB)								
NEWCOMER x POST	-0.118	0.267***	-0.504	3.577	-0.084	-0.381**	-0.389	-0.312
	[-0.311, 0.076]	[0.097, 0.437]	[-1.383, 0.375]	[-10.729, 17.882]	[-0.203, 0.034]	[-0.696, -0.066]	[-0.943, 0.164]	[-0769, 0.145]
NEWCOMER x POST x 2009	0.064	-0.117	-0.184	0.393	0.043	-0.070	-0.099	0.042
	[-0.179, 0.308]	[-0.355, 0.122]	[-1.044, 0.676]	[-2.278, 3.064]	[-0.173, 0.259]	[-0.583, 0.442]	[-0.678, 0.479]	[-0.628, 0.714]
F-stat (test of joint significance)	0.34	4.02**	1.40	1.38	0.25	2.51	2.62	1.55
R-squared	0.059	0.060	0.064	0.060	0.329	0.039	0.086	0.093
No. of Observations	1,989	1,989	1,989	1,989	1,989	1,989	1,989	1,989
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: MOB = Microfinance-Oriented Bank. DID-FE refers to difference-in-differences fixed effects. Treatment is defined as presence of MOBs in the municipality where the female-headed household is residing. Household expenditures are deflated by consumer price indices of the goods and services with base year of 2012. Weight is from logit model where the dependent variable is an indicator of whether the household stayed or not and the control variables are household head's age, sex, education, and family size as well as house ownership. The sample used to compute the weight includes households that dropped from the survey. Estimated coefficients for income and consumption are elasticities for the arcsinh-linear specification with dummy independent variables or in percentage change in the outcome variable due to the discrete change in treatment dummy = 0 to dummy = 1. The estimated coefficients for income and consumption expenditures that are not transformed into percentage change is available upon request from the author. Confidence intervals are in brackets. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 3.9: Robustness to Omitted Variable Bias of the Average Effects of Microfinance-Oriented Bank Presence

Dependent Variable	Identified Set $[\tilde{\beta}, \beta^{*\prime}(min\{1.3\,\tilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)
Panel A: Treatment Group: Continuing Clients (With MOB in 2006 and 2009)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
CONTINUING x POST	(-0.016, -0.014)	Yes	Yes	6.221
CONTINUING x POST x 2009	(0.024, 0.022)	Yes	Yes	15.049
Self-employed				
CONTINUING x POST	(0.028*, 0.036)	Yes	Yes	-3.436
CONTINUING x POST x 2009	(-0.043***, -0.038)	Yes	Yes	8.421
Household Income				
Wages & Salaries				
CONTINUING x POST	(0.076, 0.105)	Yes	Yes	-2.699
CONTINUING x POST x 2009	(-0.015, -0.126)	Yes	Yes	-0.138
Entrepreneurial Activities				
CONTINUING x POST	(0.367**, 0.433)	Yes	Yes	-5.596
CONTINUING x POST x 2009	(-0.377*, -0.397)	Yes	Yes	-19.079
Real Household Expenditure				
Food				
CONTINUING x POST	(0.021, 0.030)	Yes	Yes	-2.424
CONTINUING x POST x 2009	(-0.005, 0.000)	No	Yes	0.954
Medical Care				
CONTINUING x POST	(0.057, -0.002)	No	Yes	0.965
CONTINUING x POST x 2009	(-0.001, -0.031)	Yes	Yes	-0.041
Alcoholic Beverage & Tobacco				
CONTINUING x POST	(-0.072, -0.023)	Yes	Yes	1.483
CONTINUING x POST x 2009	(-0.007, -0.019)	Yes	Yes	-0.577
Education				
CONTINUING x POST	(0.002, 0.002)	Yes	Yes	-7.487
CONTINUING x POST x 2009	(-0.035, -0.019)	Yes	Yes	2.208
Panel B: Treatment Group: Dropout Clients (With MOB in 2006)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
DROPOUT x POST	(0.066, 0.067)	Yes	Yes	-64.533
DROPOUT x POST x 2009	(-0.159**, -0.166)	Yes	Yes	-22.206
Self-employed				
DROPOUT x POST	(0.033, 0.042)	Yes	Yes	-3.645
DROPOUT x POST x 2009	(0.128, 0.138)	Yes	Yes	-13.064
Household Income				
Wages & Salaries				
DROPOUT x POST	(-0.029, 0.024)	No	Yes	0.549
DROPOUT x POST x 2009	(-1.062*, -1.178)	Yes	Yes	-9.151
Entrepreneurial Activities				
DROPOUT x POST	(0.301, 0.382)	Yes	Yes	-3.703
DROPOUT x POST x 2009	(-0.202, -0.199)	Yes	Yes	90.836

(Continued)

Table 3.9: Continued

Dependent Variable	Identified Set $[\widetilde{\beta}, \beta^{*\prime}(min\{1.3\,\widetilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)
Real Household Expenditure				
Food				
DROPOUT x POST	(0.045, 0.060)	Yes	Yes	-3.185
DROPOUT x POST x 2009	(-0.067, -0.064)	Yes	Yes	20.122
Medical Care				
DROPOUT x POST	(1.306**, 1.247)	Yes	Yes	22.120
DROPOUT x POST x 2009	(0.350*, 0.299)	Yes	Yes	6.976
Alcoholic Beverage & Tobacco				
DROPOUT x POST	(0.135, 0.185)	Yes	Yes	-2.686
DROPOUT x POST x 2009	(-0.325, -0.343)	Yes	Yes	-17.211
Education				
DROPOUT x POST	(0.464, 0.485)	Yes	Yes	-22.474
DROPOUT x POST x 2009	(0.671***, 0.660)	Yes	Yes	60.616
Panel C: Treatment Group: Newcomer Clients (With MOB in 2009)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
NEWCOMER x POST	(-0.033, -0.029)	Yes	Yes	8.056
NEWCOMER x POST x 2009	(-0.004, -0.009)	Yes	Yes	-0.947
Self-employed				
NEWCOMER x POST	(0.076*, 0.083)	Yes	Yes	-10.036
NEWCOMER x POST x 2009	(-0.051, -0.043)	Yes	Yes	6.185
Household Income				
Wages & Salaries				
NEWCOMER x POST	(0.025, 0.114)	Yes	Yes	-0.280
NEWCOMER x POST x 2009	(-0.083, -0.239)	Yes	Yes	-0.529
Entrepreneurial Activities				
NEWCOMER x POST	(0.781, 0.887)	Yes	Yes	-7.357
NEWCOMER x POST x 2009	(0.032, 0.000)	Yes	Yes	1.004
Real Household Expenditure				
Food				
NEWCOMER x POST	(-0.045, -0.023)	Yes	Yes	2.079
NEWCOMER x POST x 2009	(0.049, 0.047)	Yes	Yes	21.119
Medical Care				
NEWCOMER x POST	(-0.087, -0.122)	Yes	Yes	-2.523
NEWCOMER x POST x 2009	(0.205, 0.158)	Yes	Yes	4.364
Alcoholic Beverage & Tobacco				
NEWCOMER x POST	(-0.033, 0.031)	No	Yes	0.511
NEWCOMER x POST x 2009	(-0.063, -0.107)	Yes	Yes	-1.413
Education				
NEWCOMER x POST	(0.053, 0.091)	Yes	Yes	-1.404
NEWCOMER x POST x 2009	(0.056, 0.057)	Yes	Yes	-43.814

Notes: MOB = Microfinance-Oriented Bank. Results in column (1) reports the identified set and $\widetilde{\boldsymbol{\beta}}$ is the treatment effect. The treatment effect of income and consumption expenditures are not in percent change but for the arcsinh-linear specification with dummy independent variables from the IPW DID-FE regression. Column (2) indicates whether the identified set excludes zero and Column (3) reports whether the estimated biased-adjusted coefficient is within the confidence interval of the estimated controlled effect $\widetilde{\boldsymbol{\beta}}$. Column (4) is the computed $\delta^0 = \frac{(\tilde{\beta}-\beta^*)(\tilde{R}-R^0)}{(\beta^0-\tilde{\beta})(R_{max}-\tilde{R})}$ where β^0 is the treatment effect and R^0 is the R^2 value in the simple regression with no controls of outcome on treatment; $\tilde{\beta}$ and $\tilde{R}$ correspond to the regression with observable controls;

Table 3.9: Continued

Dependent Variable	Identified Set $[\widetilde{\beta}, \beta^{*\prime}(min\{1.3\,\widetilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)

and β^* is equal to zero (Khan et al., 2019). δ^0 is the Altonji et al. (2005) coefficient of proportionality that would be required to attribute the treatment effect entirely to the influence of unobservables. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 3.10: Robustness to Omitted Variable Bias of the Heterogenous Effects on Bottom 30% Income Households

Dependent Variable	Identified Set $[\tilde{\beta}, \beta^{*\prime}(min\{1.3\,\tilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)
Panel A: Treatment Group: Continuing Clients (With MOB in 2006 and 2009)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
CONTINUING x POST	(-0.095***, -0.112)	Yes	Yes	-5.614
CONTINUING x POST x 2009	(0.030, 0.018)	Yes	Yes	2.518
Self-employed				
CONTINUING x POST	(0.132***, 0.162)	Yes	Yes	-4.330
CONTINUING x POST x 2009	(-0.039, -0.032)	Yes	Yes	5.386
Household Income				
Wages & Salaries				
CONTINUING x POST	(0.257, 0.257)	Yes	Yes	-543.928
CONTINUING x POST x 2009	(-0.679, -0.870)	Yes	Yes	-3.556
Entrepreneurial Activities				
CONTINUING x POST	(0.989***, 1.159)	Yes	Yes	-5.805
CONTINUING x POST x 2009	(-0.391, -0.361)	Yes	Yes	13.316
Real Household Expenditure				
Food				
CONTINUING x POST	(0.043, 0.045)	Yes	Yes	-24.458
CONTINUING x POST x 2009	(0.015, 0.017)	Yes	Yes	-7.335
Medical Care				
CONTINUING x POST	(0.097, 0.071)	Yes	Yes	3.685
CONTINUING x POST x 2009	(0.073, 0.027)	Yes	Yes	1.592
Alcoholic Beverage & Tobacco				
CONTINUING x POST	(0.115, 0.170)	Yes	Yes	-2.097
CONTINUING x POST x 2009	(-0.042, -0.083)	Yes	Yes	-1.011
Education				
CONTINUING x POST	(0.047, 0.057)	Yes	Yes	-4.764
CONTINUING x POST x 2009	(0.021, -0.029)	No	Yes	0.417
Panel B: Treatment Group: Dropout Clients (With MOB in 2006)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
DROPOUT x POST	(0.112, 0.105)	Yes	Yes	14.873
DROPOUT x POST x 2009	(-0.103, -0.112)	Yes	Yes	-10.637
Self-employed				
DROPOUT x POST	(0.018, 0.043)	Yes	Yes	-0.717
DROPOUT x POST x 2009	(0.012, 0.028)	Yes	Yes	-0.785
Household Income				
Wages & Salaries				
DROPOUT x POST	(-1.304, -1.352)	Yes	Yes	-27.355
DROPOUT x POST x 2009	(2.822***, 2.681)	Yes	Yes	19.921
Entrepreneurial Activities				
DROPOUT x POST	(-0.083, 0.022)	Yes	Yes	0.791
DROPOUT x POST x 2009	(-1.117*, -0.978)	Yes	Yes	8.068

(Continued)

Table 3.10: Continued

Dependent Variable	Identified Set $[\widetilde{\beta}, \beta^{*\prime}(min\{1.3\,\widetilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)
Real Household Expenditure				
Food				
DROPOUT x POST	(0.033, 0.019)	Yes	Yes	2.252
DROPOUT x POST x 2009	(-0.075**, -0.061)	Yes	Yes	5.265
Medical Care				
DROPOUT x POST	(0.830***, 0.786)	Yes	Yes	18.885
DROPOUT x POST x 2009	(-0.148, -0.178)	Yes	Yes	-4.993
Alcoholic Beverage & Tobacco				
DROPOUT x POST	(-0.526, -0.503)	Yes	Yes	23.312
DROPOUT x POST x 2009	(0.305, 0.249)	Yes	Yes	5.445
Education				
DROPOUT x POST	(-0.628*, -0.662)	Yes	Yes	-18.534
DROPOUT x POST x 2009	(0.783***, 0.765)	Yes	Yes	42.513
Panel C: Treatment Group: Newcomer Clients (With MOB in 2009)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
NEWCOMER x POST	(-0.076, -0.095)	Yes	Yes	-3.833
NEWCOMER x POST x 2009	(0.011, 0.005)	Yes	Yes	1.876
Self-employed				
NEWCOMER x POST	(0.067, 0.097)	Yes	Yes	-2.195
NEWCOMER x POST x 2009	(-0.112, -0.104)	Yes	Yes	13.679
Household Income				
Wages & Salaries				
NEWCOMER x POST	(0.202, 0.201)	Yes	Yes	226.081
NEWCOMER x POST x 2009	(-0.836, -1.016)	Yes	Yes	-4.649
Entrepreneurial Activities				
NEWCOMER x POST	(0.378, 0.577)	Yes	Yes	-1.898
NEWCOMER x POST x 2009	(-0.827, -0.814)	Yes	Yes	64.484
Real Household Expenditure				
Food				
NEWCOMER x POST	(-0.115**, -0.108)	Yes	Yes	16.465
NEWCOMER x POST x 2009	(0.072, 0.068)	Yes	Yes	17.434
Medical Care				
NEWCOMER x POST	(-0.273, -0.269)	Yes	Yes	60.129
NEWCOMER x POST x 2009	(0.084, 0.010)	Yes	Yes	1.142
Alcoholic Beverage & Tobacco				
NEWCOMER x POST	(-0.017, 0.041)	No	Yes	0.290
NEWCOMER x POST x 2009	(-0.212, -0.310)	Yes	Yes	-2.156
Education				
NEWCOMER x POST	(0.066, 0.084)	Yes	Yes	-3.632
NEWCOMER x POST x 2009	(-0.117, -0.203)	Yes	Yes	-1.359

Notes: MOB = Microfinance-Oriented Bank. Results in column (1) reports the identified set and $\widetilde{\boldsymbol{\beta}}$ is the treatment effect. The treatment effect of income and consumption expenditures are not in percent change but for the arcsinh-linear specification with dummy independent variables from the IPW DID-FE regression. Column (2) indicates whether the identified set excludes zero and Column (3) reports whether the estimated biased-adjusted coefficient is within the confidence interval of the estimated controlled effect $\widetilde{\boldsymbol{\beta}}$. Column (4) is the computed $\delta^0 = \frac{(\tilde{\beta}-\beta^*)(\tilde{R}-R^0)}{(\beta^0-\tilde{\beta})(R_{max}-\tilde{R})}$ where β^0 is the treatment effect and R^0 is the R^2 value in the simple regression with no controls of outcome on treatment; $\tilde{\beta}$ and $\tilde{R}$ correspond to the regression with observable controls;

Table 3.10: Continued

Dependent Variable	Identified Set $[\widetilde{\beta}, \beta^{*\prime}(min\{1.3\,\widetilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)

and β^* is equal to zero (Khan et al., 2019). δ^0 is the Altonji et al. (2005) coefficient of proportionality that would be required to attribute the treatment effect entirely to the influence of unobservables. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table 3.11: Robustness to Omitted Variable Bias of the Heterogenous Effects on Female-Headed Households

Dependent Variable	Identified Set $[\tilde{\beta}, \beta^{*\prime}(min\{1.3\,\tilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)
Panel A: Treatment Group: Continuing Clients (With MOB in 2006 and 2009)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
CONTINUING x POST	(-0.060*, -0.072)	Yes	Yes	-5.445
CONTINUING x POST x 2009	(0.053, 0.057)	Yes	Yes	-12.525
Self-employed				
CONTINUING x POST	(0.076, 0.101)	Yes	Yes	-2.980
CONTINUING x POST x 2009	(-0.50 -0.047)	Yes	Yes	17.245
Household Income				
Wages & Salaries				
CONTINUING x POST	(-0.359, -0.379)	Yes	Yes	-17.600
CONTINUING x POST x 2009	(0.054, 0.034)	Yes	Yes	2.692
Entrepreneurial Activities				
CONTINUING x POST	(1.148**, 1.340)	Yes	Yes	-5.965
CONTINUING x POST x 2009	(-0.190, -0.005)	Yes	Yes	1.029
Real Household Expenditure				
Food				
CONTINUING x POST	(-0.052, -0.055)	Yes	Yes	-18.650
CONTINUING x POST x 2009	(0.032, 0.046)	Yes	Yes	-2.224
Medical Care				
CONTINUING x POST	(0.076, -0.048)	No	Yes	0.614
CONTINUING x POST x 2009	(0.013, -0.032)	No	Yes	0.290
Alcoholic Beverage & Tobacco				
CONTINUING x POST	(-0.298, -0.321)	Yes	Yes	-13.109
CONTINUING x POST x 2009	(0.132, 0.145)	Yes	Yes	-10.438
Education				
CONTINUING x POST	(-0.117, -0.089)	Yes	Yes	4.199
CONTINUING x POST x 2009	(0.402**, 0.481)	Yes	Yes	-5.116
Panel B: Treatment Group: Dropout Clients (With MOB in 2006)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
DROPOUT x POST	(0.024, 0.002)	Yes	Yes	1.090
DROPOUT x POST x 2009	(-0.024, -0.016)	Yes	Yes	3.226
Self-employed				
DROPOUT x POST	(0.260*, 0.288)	Yes	Yes	-9.314
DROPOUT x POST x 2009	(-0.041, -0.033)	Yes	Yes	5.233
Household Income				
Wages & Salaries				
DROPOUT x POST	(-1.340, -1.071)	Yes	Yes	4.979
DROPOUT x POST x 2009	(2.090, 2.172)	Yes	Yes	-25.384
Entrepreneurial Activities				
DROPOUT x POST	(1.149*, 1.493)	Yes	Yes	-3.336
DROPOUT x POST x 2009	(-1.656, -1.485)	Yes	Yes	9.705

(Continued)

Table 3.11: Continued

Dependent Variable	Identified Set $[\widetilde{\beta}, \beta^{*'}(min\{1.3\,\widetilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)
Real Household Expenditure				
Food				
DROPOUT x POST	(0.108, 0.166)	Yes	Yes	-1.871
DROPOUT x POST x 2009	(0.018, 0.050)	Yes	Yes	-0.568
Medical Care				
DROPOUT x POST	(1.966***, 1.920)	Yes	Yes	42.483
DROPOUT x POST x 2009	(0.227, 0.211)	Yes	Yes	14.789
Alcoholic Beverage & Tobacco				
DROPOUT x POST	(0.871***, 0.955)	Yes	Yes	-10.349
DROPOUT x POST x 2009	(0.022, 0.040)	Yes	Yes	-1.270
Education				
DROPOUT x POST	(0.312, 0.455)	Yes	Yes	-2.178
DROPOUT x POST x 2009	(0.752, 0.848)	Yes	Yes	-7.879
Panel C: Treatment Group: Newcomer Clients (With MOB in 2009)				
Control Group: Never Clients (No MOB)				
Employment Status				
Employed				
NEWCOMER x POST	(-0.118, -0.130)	Yes	Yes	-9.700
NEWCOMER x POST x 2009	(0.064, 0.066)	Yes	Yes	-47.788
Self-employed				
NEWCOMER x POST	(0.267***, 0.291)	Yes	Yes	-11.305
NEWCOMER x POST x 2009	(-0.117, -0.117)	Yes	Yes	-123.724
Household Income				
Wages & Salaries				
NEWCOMER x POST	(-0.701, -0.642)	Yes	Yes	12.019
NEWCOMER x POST x 2009	(-0.204, -0.278)	Yes	Yes	-2.731
Entrepreneurial Activities				
NEWCOMER x POST	(1.521, 1.718)	Yes	Yes	-7.702
NEWCOMER x POST x 2009	(0.331, 0.361)	Yes	Yes	-10.980
Real Household Expenditure				
Food				
NEWCOMER x POST	(-0.088, -0.071)	Yes	Yes	5.221
NEWCOMER x POST x 2009	(0.042, 0.050)	Yes	Yes	-5.237
Medical Care				
NEWCOMER x POST	(-0.480*, -0.553)	Yes	Yes	-6.549
NEWCOMER x POST x 2009	(-0.073, -0.109)	Yes	Yes	-2.047
Alcoholic Beverage & Tobacco				
NEWCOMER x POST	(-0.493, -0.509)	Yes	Yes	-30.598
NEWCOMER x POST x 2009	(-0.105, -0.143)	Yes	Yes	-2.694
Education				
NEWCOMER x POST	(-0.374, -0.320)	Yes	Yes	6.862
NEWCOMER x POST x 2009	(0.042, 0.082)	Yes	Yes	-1.044

Notes: MOB = Microfinance-Oriented Bank. Results in column (1) reports the identified set and $\widetilde{\boldsymbol{\beta}}$ is the treatment effect. The treatment effect of income and consumption expenditures are not in percent change but for the arcsinh-linear specification with dummy independent variables from the IPW DID-FE regression. Column (2) indicates whether the identified set excludes zero and Column (3) reports whether the estimated biased-adjusted coefficient is within the confidence interval of the estimated controlled effect $\widetilde{\boldsymbol{\beta}}$. Column (4) is the computed $\delta^0 = \frac{(\tilde{\beta}-\beta^*)(\tilde{R}-R^0)}{(\beta^0-\tilde{\beta})(R_{max}-\tilde{R})}$ where β^0 is the treatment effect and R^0 is the R^2 value in the simple regression with no controls of outcome on treatment; $\tilde{\beta}$ and $\tilde{R}$ correspond to the regression with observable controls; and β^* is equal to zero (Khan et al., 2019). δ^0 is the Altonji et al. (2005) coefficient of proportionality that would be required

Table 3.11: Continued

Dependent Variable	Identified Set $[\tilde{\beta}, \beta^{*\prime}(min\{1.3\,\tilde{R},1\}),1]$	Exclude Zero?	Within Confidence Interval?	δ^0 for β=0
	(1)	(2)	(3)	(4)

to attribute the treatment effect entirely to the influence of unobservables. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Appendices

Table A3.1: Logit Estimates of Probability Household Stayed

Variable	Coefficients	Standard Error
Household Head Sex (1=male; 2=female)	-0.130*	0.072
Household Head Age	0.007***	0.002
Household Head Education	-0.003	0.003
Family Size	0.055***	0.007
House and/or land ownership (1=yes, 0=no)	0.273***	0.097
No. of Observations	42,094	

Notes: Statistically significant at ***1%, **5%, and *10% level.

Table A3.2: Balance in Covariates Across Stayers and Attritors after Using Inverse Probability of Treatment Weights with the Propensity Score

	Mean in Stayers	Mean in Attritors	Standardized difference
Household Head Sex (1=male; 2=female)	1.16	1.16	0.011
Household Head Age	46.37	46.27	0.007
Household Head Education	8.61	8.46	0.008
Family Size	4.84	4.84	0.002
Amount of financial assets owned	8,788.11	7,021.21	0.019
House and/or land ownership (1=yes, 0=no)	0.69	0.69	-0.007

Table A3.3: Balance in Covariates Across Treatment and Control Groups after Using Inverse Probability of Treatment Weights with the Propensity Score

	Mean in Treated	Mean in Control	Standardized difference
Household Head Sex (1=male; 2=female)	1.52	1.49	0.096
Household Head Age	50.54	49.91	0.046
Household Head Education	8.01	8.11	-0.006
Family Size	51.16	50.69	0.023
Amount of financial assets owned	9,957.39	7,049.06	0.048
House and/or land ownership (1=yes, 0=no)	0.76	0.78	-0.054

Table A3.4: Heterogeneous Effects of Microfinance-Oriented Bank Presence on Upper 70% Income Households: IPW DID-FE

	Employment Status		Income		Real Expenditure			
	Employed	**Self-employed**	**Wage & Salaries**	**Entrepreneurial Activities**	**Food**	**Medical Care**	**Alcoholic Beverage & Tobacco**	**Education**
Panel A: Treatment Group: Continuing Clients (With MOB in 2006 and 2009)								
Control Group: Never Clients (No MOB)								
CONTINUING x POST	0.024	-0.008	-0.070	0.047	0.020	0.063	-0.132	-0.051
	[-0.014, 0.062]	[-0.047, 0.031]	[-0.485, 0.345]	[-0.404, 0.497]	[-0.027, 0.067]	[-0.181, 0.306]	[-0.297, 0.033]	[-0.259, 0.158]
CONTINUING x POST x 2009	-0.001	-0.022	0.244	-0.159	-0.003	-0.051	0.023	0.021
	[-0.037, 0.034]	[-0.063, 0.019]	[-0.296 0.785]	[-0.593, 0.274]	[-0.048, 0.042]	[-0.289, 0.188]	[-0.177, 0.224]	[-0.159, 0.201]
F-stat (test of joint significance)	1.13	1.62	0.46	0.18	0.33	0.00	1.15	0.06
R-squared	0.026	0.012	0.035	0.012	0.208	0.028	0.020	0.057
No. of Observations	13,386	13,386	13,386	13,386	13,386	13,386	13,386	13,386
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Treatment Group: Dropout Clients (With MOB in 2006)								
Control Group: Never Clients (No MOB)								
DROPOUT x POST	0.051	0.062	-0.219	0.513	0.015	2.783	0.321	1.012
	[-0.074, 0.175]	[-0.155, 0.278]	[-1.708, 1.270]	[-0.739, 1.765]	[-0.444, 0.475]	[-2.406, 7.973]	[-0.793, 1.436]	[-0.449, 2.472]
DROPOUT x POST x 2009	-0.230***	0.204**	-0.812***	-0.072	-0.075	0.446	-0.351	0.691
	[-0.384, -0.076]	[0.004, 0.405]	[-0.931, -0.693]	[-1.147, 1.002]	[-0.310, 0.160]	[-0.434, 1.327]	[-0.997, 0.295]	[-0.828, 2.210]
F-stat (test of joint significance)	3.42*	1.73	3.21*	0.54	0.35	11.49***	0.38	4.38**
R-squared	0.031	0.017	0.031	0.011	0.203	0.039	0.016	0.065
No. of Observations	8,594	8,594	8,594	8,594	8,594	8,594	8,594	8,594
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Treatment Group: Newcomer Clients (With MOB in 2009)								
Control Group: Never Clients (No MOB)								
NEWCOMER x POST	-0.039	0.101**	-0.275	1.630	-0.019	0.042	0.193	0.044
	[-0.138, 0.060]	[0.020, 0.183]	[-1.021, 0.470]	[-1.295, 4.554]	[-0.077, 0.038]	[-0.335, 0.419]	[-0.403, 0.789]	[-0.475, 0.562]
NEWCOMER x POST x 2009	0.026	-0.062	0.318	0.604	0.013	0.282	-0.225	0.116
	[-0.092, 0.143]	[-0.159, 0.036]	[-1.080, 1.716]	[-1.463, 2.672]	[-0.104, 0.130]	[-0.419, 0.983]	[-0.573, 0.124]	[-0.206, 0.439]
F-stat (test of joint significance)	0.08	1.30	0.01	7.41***	0.01	0.76	0.20	0.28
R-squared	0.031	0.015	0.030	0.012	0.207	0.030	0.018	0.062
No. of Observations	8,825	8,825	8,825	8,825	8,825	8,825	8,825	8,825
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: MOB = Microfinance-Oriented Bank. DID-FE refers to difference-in-differences fixed effects. Treatment is defined as presence of microfinance-oriented banks in the municipality where the non-poor household is residing. Household expenditures are deflated by consumer price indices of the goods and services with base year of 2012. Weight is from logit model where the dependent variable is an indicator of whether the household stayed or not and the control variables are household head's age, sex, education, and family size as well as house ownership. The sample used to compute the weight includes households that dropped from the survey. Estimated coefficients for income and consumption are elasticities for the arcsinh-linear specification with dummy independent variables or in percentage change in the outcome variable due to the discrete change in treatment dummy = 0 to dummy = 1. The estimated coefficients for income and consumption expenditures that are not transformed into percentage change is available upon request from the author. Confidence intervals are in brackets. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Table A3.5: Heterogeneous Effects of Microfinance-Oriented Bank Presence on Male-Headed Households: IPW DID-FE

	Employment Status		Income		Real Expenditure			
	Employed	**Self-employed**	**Wage & Salaries**	**Entrepreneurial Activities**	**Food**	**Medical Care**	**Alcoholic Beverage & Tobacco**	**Education**
Panel A: Treatment Group: Continuing Clients (With MOB in 2006 and 2009)								
Control Group: Never Clients (No MOB)								
CONTINUING x POST	-0.009	0.016	0.099	0.329	0.026	0.061	-0.051	0.033
	[-0.045, 0.026]	[-0.020, 0.053]	[-0.353, 0.551]	[-0.211, 0.869]	[-0.024, 0.076]	[-0.133, 0.256]	[-0.208, 0.107]	[-0.134, 0.201]
CONTINUING x POST x 2009	0.027	-0.044**	0.082	-0.336***	-0.004	-0.004	-0.050	-0.117
	[-0.008, 0.063]	[-0.082, -0.006]	[-0.343, 0.508]	[-0.584, -0.089]	[-0.049, 0.040]	[-0.208, 0.199]	[-0.215, 0.114]	[-0.257, 0.024]
F-stat (test of joint significance)	0.68	1.53	0.86	0.32	0.67	0.28	1.28	0.83
R-squared	0.014	0.011	0.039	0.013	0.229	0.024	0.018	0.087
No. of Observations	15,691	15,691	15,691	15,691	15,691	15,691	15,691	15,691
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Treatment Group: Dropout Clients (With MOB in 2006)								
Control Group: Never Clients (No MOB)								
DROPOUT x POST	0.054	-0.044	1.032	0.287	0.043	1.921	-0.070	0.766
	[-0.048, 0.158]	[-0.119, 0.030]	[-1.983, 4.046]	[-0.745, 1.318]	[-0.346, 0.432]	[-2.103, 5.946]	[-1.191, 1.051]	[-0.779, 2.311]
DROPOUT x POST x 2009	-0.058	0.053**	-0.635*	0.105	-0.066	0.278	0.015	0.686
	[-0.138, 0.022]	[0.009, 0.096]	[-1.278, 0.008]	[-1.105, 1.315]	[-0.224, 0.092]	[-0.603, 1.160]	[-0.171, 0.201]	[-0.441, 1.812]
F-stat (test of joint significance)	0.01	0.04	0.04	0.97	0.05	4.11**	0.01	15.68***
R-squared	0.013	0.012	0.033	0.014	0.223	0.031	0.019	0.088
No. of Observations	9,962	9,962	9,962	9,962	9,962	9,962	9,962	9,962
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Treatment Group: Newcomer Clients (With MOB in 2009)								
Control Group: Never Clients (No MOB)								
NEWCOMER x POST	-0.018	0.029	0.074	0.957	-0.041	-0.005	0.016	0.193
	[-0.122, 0.085]	[-0.049, 0.107]	[-0.881, 1.030]	[-0.308, 2.223]	[-0.096, 0.015]	[-0.336, 0.326]	[-0.358, 0.389]	[-0.206, 0.592]
NEWCOMER x POST x 2009	-0.006	-0.041	0.179	-0.112	0.067	0.304	-0.033	0.024
	[-0.103, 0.092]	[-0.121, 0.038]	[-0.988, 1.347]	[-1.334, 1.111]	[-0.031, 0.166]	[-0.297, 0.906]	[-0.309, 0.243]	[-0.234, 0.282]
F-stat (test of joint significance)	0.19	0.06	0.15	0.95	0.17	0.88	0.02	1.38
R-squared	0.013	0.011	0.033	0.013	0.226	0.025	0.020	0.085
No. of Observations	10,290	10,290	10,290	10,290	10,290	10,290	10,290	10,290
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: MOB = Microfinance-Oriented Bank. DID-FE refers to difference-in-differences fixed effects. Treatment is defined as presence of microfinance-oriented banks in the municipality where the male-headed household is residing. Household expenditures are deflated by consumer price indices of the goods and services with base year of 2012. Weight is from logit model where the dependent variable is an indicator of whether the household stayed or not and the control variables are household head's age, sex, education, and family size as well as house ownership. The sample used to compute the weight includes households that dropped from the survey. Estimated coefficients for income and consumption are elasticities for the arcsinh-linear specification with dummy independent variables, in percentage change in the outcome variable due to the discrete change in treatment dummy = 0 to dummy = 1. The estimated coefficients for income and consumption expenditures that are not transformed into percentage change is available upon request from the authors. Confidence intervals are in brackets. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level, respectively.

Chapter 4

Conclusions and Policy Implications

4.1 Conclusion

The microfinance industry grants credit to the low-income and marginalized sector with little or no collateral, at low interest rates. This lending practice is said to allow its clients – the poor and women – who have been unserved or underserved by the formal banking sector to reduce reliance to the informal credit market, engage in income-generating self-employment activities, and improve their welfare. However, these claims about the benefits of microfinance are still far from accepted in the literature, as measured impacts vary depending on the data used and the methods employed. This dissertation revisits the influence of microfinance providers on households' informal borrowing, and seeks to determine if it is indeed welfare-improving.

4.1.1 Chapter 2: Substitutability or complementary roles of microfinance providers

Even though the lending practices of microfinance providers mimic those of informal lenders, moneylenders and relatives and friends continue to thrive and remain to be a primary credit source for the low-income segment of the population of the Philippines.

In Chapter 2, I examined whether microfinance providers substitute or complement moneylenders and relatives and friends. The contribution of this study differs from that of others in the literature that investigate the substitutability or complementary role of microfinance providers in the following respects. First, both the likelihood (extensive margin) of borrowing from credit sources and the amount (intensive margin) of the funds

borrowed are examined. Second, informal credit sources are differentiated into two types of lenders: namely moneylenders; and relatives and friends. Third, a multivariate probit and SUR are used to identify the substitutability or complementarity role of microfinance providers. Lastly, this study consolidates the lending practices of twenty-three microfinance providers to illustrate the mechanisms that make microfinance providers substitute for moneylenders, relatives and friends, and other formal lenders.

To investigate the likelihood of household borrowing from credit sources, a multivariate probit model is employed, while a seemingly unrelated regression is used to determine the extent of credit demanded by household in terms of actual amount borrowed. The correlation of error terms derived from these models identifies the presence or absence of substitutability or complementarity role of microfinance providers.

We find that microfinance providers are substitutes for moneylenders, relatives and friends, and other formal lenders, although not for government institutions. This is because government institutions often serve as conduits of funds for microfinance providers by providing them direct and convenient access to credit and technical assistance specially designed to support their activities. We observed that collateral-poor or self-employed heads of households are served by microfinance providers, which are the types of clients also catered by either moneylenders or relatives and friends. Moreover, households with many family members are more likely to borrow from microfinance providers. But among poor or female-headed households, results on the extensive margin indicate that microfinancing neither substitutes nor complements household borrowing from informal lenders and other formal lenders except for other lending institutions that displayed increased (complementary)

likelihood of borrowing among poor households and reduced (substitutes) likelihood of borrowing of female-headed households.

As for the extent of credit demanded, microfinance lending is associated with reduced borrowing from informal and other formal lenders. Households with older or self-employed heads, large family size, or collateral-poor households can borrow relatively more from microfinance providers.

Overall, the results support the widely held view that microfinance providers can compete with moneylenders and relatives and friends in providing households cheap source of loan. However, this study does not seek to determine if access to microfinance is welfare-improving. Some impact assessment studies find evidence that exposure to microfinance programs can permanently reduce consumption of certain goods, increase consumption of temptation goods, or even decrease engagement in business activities and the hiring of employees. This issue was explored in Chapter 3.

4.1.2 Chapter 3: Microfinance-Oriented Banks and Welfare Outcomes

Chapter 3 examines household welfare outcomes of access to microfinance via the presence of MOBs in municipalities. This study differs from other empirical studies in that it evaluates the sensitivity of the outcomes to the length (i.e., short- and long-term) of MOB presence and characterizes outcome duration as immediate, incremental, persistent, and total (or net). The measures of household welfare examined in this study are the probability of and income from wage work and from self-employment, as well as consumption expenditures

(i.e., food, medical care, alcoholic beverages and tobacco, and education). The study also determines if there are poverty level and gender differences in the outcomes.

A DID-FE is utilized in combination with IPW to address the endogeneity problem associated with self-selection and sample attrition, which are common concerns when using observational panel data. The methodologies developed by Oster (2019) and Altonji et al. (2005) are also employed to check the robustness of treatment effects from IPW DID-FE model against unobserved confounders.

Results suggest that households that have had access to microfinance through MOBs for a longer period are more likely to engage in entrepreneurial activities and that their income from self-employment activities increased. However, these gains are only short-lived as the effect either diminished or regressed years after the presence of MOBs. Households that have short-term MOB presence are observed to increase non-food expenditures in particular, spending on medical care and education. There was average positive effect on education and negative effect on likelihood of and income from wage work, even during the period after MOB ceased operation.

Regarding heterogeneous effects, longer presence of MOBs increased poor households' likelihood of being self-employed. Transitory access to microfinance did not result in an immediate increase in self-employment activities, and non-food expenditures such as education decreased temporarily. It is also noted that regardless of the length of MOB presence, either probability of or income from wage work decreased, which indicates that there is disutility towards casual (day) labor or salaried work. Female-headed households enjoyed positive effect on non-food expenditures when MOB presence was short-term, but

for longer-term presence only an incremental increase in education spending was observed. I also extended the analysis to include non-poor households and male-headed households. The results indicate that non-poor households gained more while male heads benefited less from MOB presence.

I conclude that access to microfinance through MOBs is not transformative in the sense of moving households out of poverty; rather, it reduces vulnerability by giving households the option to be entrepreneurs and spend more on health and education.

4.2 Policy Implications

In cognizance of these findings, I recommend a three-pronged course of actions to ensure that microfinance providers can sustainably service the low-income and marginalized sector of the economy, and that access to their goods and services is welfare-improving.

First, *expand access to funding sources to facilitate financially self-sustainable microfinance operations*. Results of Consultative Group to Assist the Poorest (CGAP) – MIX survey of 140 microfinance institutions indicate that deficient funds are the primary constraint on sustainability of microfinance operations (CGAP/MIX, 2004). Policymakers and proponents of microfinance may want to set in place initiatives to transform traditional non-bank microfinance institutions with good track records and high potential into regulated deposit-taking financial institutions. Transforming traditional microfinance institutions (e.g., NGOs) to licensed deposit-taking financial institutions will expand microfinance institutions' access to a broader array of funding sources (e.g., savings, bonds, and equity) from wholesale

refinancing institutions than just relying on charity or non-profit organizations. Non-bank microfinance institutions often rely on donor funding to sustain operations, but reliance on donor funds makes them vulnerable to changing political priorities.

Second, *facilitate graduation of microfinance clients*. While we cannot identify the root causes of the subtle impacts of microfinance, it seems likely that the diminishing or regressive impacts of long-term presence of MOB may be attributable to the smaller amounts of loans offered to microfinance clients, which are not large enough to cover borrowing costs or the expansion of existing microbusinesses. If this is the case, from a policy standpoint, it would be necessary to facilitate microfinance clients to borrow higher amounts of working capital, based on their financial needs. This kind of initiative is currently being implemented in the Philippines by CARD Mutually Reinforcing Institutions (CARD MRI), which provides microloans and assists its clients who have evolved into medium- or large-scale entrepreneurs and are in need of larger loans from universal/commercial and thrift banks.

Lastly, *complement credit with client, entrepreneurship, or business development services*. Credit should be accompanied by complementary development services such as linking entrepreneurs to markets (e.g., agricultural value-chain financing, market matching, or trade fairs); training in product development and marketing; and entrepreneurship education. Such initiatives would foster product diversification, integrate microfinance borrowers into broader and high value markets, and enhance borrowers' business skills, thereby enabling borrowers to run their business profitably, increasing business opportunities, and avoid business closures.

4.3 Future Research

This dissertation establishes the substitutive role of microfinance in the provision of cheap credit and the reduction of vulnerability, especially for the poor and women. It is hoped that these findings will encourage further empirical studies on the issues involved in advocating microfinance as an effective tool for poverty reduction and female empowerment, and lead to better micro- and macro-prudential policies towards a financially self-sustainable microfinance industry that will provide a wide range of products and services.

I suggest evaluating the dynamics of microfinance providers' substitutive role over time to allow for a more robust evaluation of the factors influencing household lender choice. My analyses were limited to cross-sectional data because there are no available panel data at the time of study; future studies would benefit from using a panel dataset. Finally, the findings of this dissertation on the effects of MOB presence could not account for NGO microfinance providers due to lack of available information about their locations. It is important that future studies examine whether the magnitudes do in fact increase, and whether the direction of the impacts is the same in the presence of NGO microfinance providers in municipalities where there are MOBs.

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